July 1999
Volume 67 No 7

Amateur Radio

Journal of the Wireless Institute of Australia

Full of the latest amateur radio news, information and technical articles, including...

- An L&T-Match Design Chart
- An RF Resistance Bridge
- The Classic Adelaide Car Rally
- The WIA Federal Video Tape Library
- Not all is 'old that Glitters
- A Microphone Impedance Pre-Amp

Plus *lots of other articles, news and special interest columns.*

COMMUNICATIONS BONANZA!

Uniden UHF CB RADIO
BONUS ANTENNA, BASE & LEAD
SAVE $100

$218 TAX EX

Uniden UH077 40 CHANNEL UHF CB
BONUS ANTENNA, BASE & LEAD

$249 TAX EX

GME Electrophone TX3000 40 CHANNEL UHF CB
BONUS ANTENNA, BASE & LEAD

$299 TAX EX

Uniden UH088 UHF CB RADIO
BONUS ANTENNA, BASE & LEAD

$279 TAX EX

Uniden UH045 UHF CB RADIO

$169 TAX EX

Uniden UH053 UHF 2 WAY CB HANDHELD
BONUS CASE

$199 TAX EX

Uniden UH054/A UHF 2 WAY CB WATERPROOF

$279 TAX EX

Uniden UH054/L UHF 2 WAY CB HANDHELD

$249 TAX EX

LEXMARK HAND HELD

$239 TAX EX

Uniden UH056 HANDHELD UHF CB

$359 TAX EX

Uniden UH057 HANDHELD UHF CB
BONUS CASE

$369 TAX EX

GME Electrophone TX6000 PORTABLE UHF TRANSCEIVER
BONUS CASE

$399 TAX EX

GME Electrophone TX4200 UHF TRANSCEIVER
BONUS ANTENNA, BASE & LEAD

$359 TAX EX

Uniden UH100 40 CHANNEL UHF CB
BONUS ANTENNA, BASE & LEAD

$299 TAX EX

GME Electrophone TX4000R REMOTE MOUNTING UHF TRANSCEIVER

$489 TAX EX

GME Electrophone TX830 CB RADIO

GREAT VALUE! $139 TAX EX

GME Electrophone GLOBAL POSITIONING SYSTEM WITH ELECTRONIC MAPPING

NEW MODEL $659 TAX EX

GME Electrophone GPS12XL HANDHELD GPS RECEIVER
BONUS CASE

$499 TAX EX

GME Electrophone GPS38 HANDHELD GPS RECEIVER
SAVE $20

$299 TAX EX

AUDIOLINE 10 CHANNEL CORDLESS PHONE

RRP $129 $88

Omni DIGITAL CORDLESS PHONE
UP TO 1 KM RANGE
SAVE $50

$199

MULTI HANDSET CORDLESS PHONE + DIGITAL ANSWERING MACHINE + DUPLEX SPEAKER PHONE
BONUS HANDSET & CHARGER VALUE $109

$299

HIGH RESOLUTION SCANNER

RRP $169
600X600 DPI $138

Canon PLAIN PAPER BUBBLE JET FAX MACHINE

$529

LEXMARK COLOUR JET PRINTER

RRP $169 $128

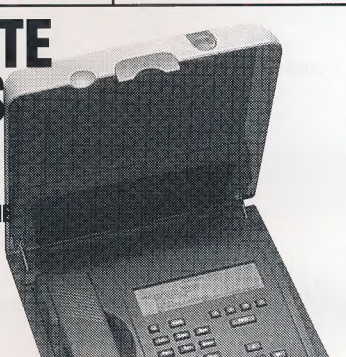
Canon COLOUR BUBBLE JET PRINTER

RRP $199 $159

ALCATEL ONE TOUCH (view)
ONE LOW RATE APPLIES FOR ALL CALLS

PLUS FREE EXTENDED WARRANTY FREE CARRY POUCH
$29#

SATELLITE PHONES EX-RENTAL
MINI-SAT WORLD PHONE
- Fits in a brief case
- The phone you can use anywhere
- Not restricted by networks


LIMITED STOCK!
SAVE UP TO $2000

Brisbane Car sound
A Division of Strathfield Group

MAIL ORDER
PHONE: (07) 4639 1455
FAX: (07) 4639 2018

BCS6517

#To new and approved Customers. The minimum package cost for Customers who remain connected for 24 continuous months is Alactel View $454 (Includes $65 connection fee and 24 months access fees on Value 10) plus call charges. +For a limited time to analogue customers who take up a new digital service in the same name. While Stocks last. Not available with other Telstra MobileNet offers. Limit 3 per customer (except in SA). No trade sales. ID required. Ask us for further details. Some pictures used for illustration purposes only. Limited stocks available.

Telstra MobileNet

Amateur Radio

The Journal of the Wireless Institute of Australia

ISSN 0002-6859

Volume 67
Number 7
July 1999

Amateur Radio is published by the Wireless Institute of Australia ACN004 920 745 as its official Journal on the first Friday of each month

Editorial

Editor:	Bill Rice*	VK3ABP
Production Manager:	Bob Harper	VK4KNH
Snr Technical Editor:	Peter Gibson*	VK3AZL
Technical Editors:	Evan Jarman*	VK3ANI
	Gil Sones*	VK3AUI
Contributing Editors:	Ron Fisher*	VK3OM
	Don Jackson*	VK3DBB
WIA News Editor:	David Thompson	VK2NH

*Publications Committee member

Advertising

Mrs June Fox, WIA Federal Office
PO Box 2175 CAULFIELD JUNCTION VIC 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email armag@hotkey.net.au

Hamads

"Hamads" *Newsletters Unlimited*
29 Tanner Street, Richmond VIC 3121
Fax: (03) 9428 4242
e-mail: *newsl@webtime.com.au*

***Amateur Radio* Correspondence**

All correspondence, contributions and queries about the ***content*** should be sent to:

The Editor *Amateur Radio*
PO Box 2175, CAULFIELD JUNCTION VIC 3161
email armag@hotkey.net.au
Tel: (03) 9528 5962 Fax (03) 9523 8191

***Amateur Radio* Delivery**

All queries regarding delivery should be directed to:

Amateur Radio WIA Federal Office
PO Box 2175 Caulfield Junction Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191

Registered Office

10/229 Balaclava Road
Caulfield North VIC 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
Business hours: 9.30am-3pm weekdays

Editorial & Display Booking Deadlines

August	**11/7/99**
September	**13/8/99**
October	**10/9/99**

Hamad & Display Material Deadline

August	**21/7/99**
September	**20/8/99**
October	**17/9/99**

Production

Administration, Drafting, Design & Sub-editing
Shadetree Publishing & Imaging
PO Box 288 BEERWAH QLD 4519

Pre-press, print and mail management
Newsletters Unlimited (03) 9428 3458

Printed by **Streamline Press, Melbourne** (03) 9417 2766

Mailed by **IMS, Melbourne** (03) 9291 5888

Receipt of *Amateur Radio* by mail

This issue was delivered to Australia Post on Wednesday July 7 If you are a financial member and have not received your copy by the 15th of the month please check with your local Post Office before contacting the registered office of the WIA.

Copyright and Reproduction

The copyright in this magazine, except where specifically noted, is held by Wireless Institute of Australia ©WIA 1999.
Permission to republish articles in any form must be obtained in writing from the Institute (other than for purposes of 'fair dealing'). This permission is usually freely given for information purposes.

General

The Classic Adelaide Car Rally 12
Christine Taylor VK5CTY

On Video — WIA Federal Videotape Library 39
Don Bland VK4TVD

Monitoring Station of Yesteryear 51
John Wright L21068

Technical

All is not old that glitters 15
Mike Krochmal, VK3KRO

An L&T-Match Design Chart 17
Graham Thornton VK3IY

An RF Resistance Bridge 24
Drew Diamond VK3XU

Mike Impedance Matcher 30
Bob Harper VK4KNH

Technical Abstracts 32
Gil Sones VK3AUI

Columns

Advertisers' Index 56
ALARA 10
AMSAT Australia 42
ARDF 45
Awards 48
Club News 9
Contests 49
WIA Division News
VK3 Notes 6
VK4 Notes 7
VK6 Notes 7
Editor's Comment 2
Hamads 54
HF Predictions 52
New Members 2
Over to You 11
Pounding Brass 46
Repeater Link 44
Silent Keys 38
Spotlight on SWLing 50
Try This 47
VHF/UHF - An Expanding World 35
WIA Comment 3
WIA News 3
WIA Division Directory 56
WIA Federal Directory 2

Our cover this month

"Snow DF"

Partaking in a DF hunt at Mt Buller were Graham VK3KOA, Mark VK3JMD, Jack VK3WWW, Craig VK3CRA (SK 29/5/98) and Paul Bilston SWL.

Photo by Jack Bramham VK3WWW 1995.

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the Federal Office on receipt of a stamped self-addressed envelope.

Back Issues

Back issues are available directly from the WIA Federal Office (until stocks are exhausted, at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest
National Radio Society
Founded 1910

Representing
The Australian Amateur Radio Service

Member of the
International Amateur Radio Union

Registered Federal Office of the WIA
10/229 Balaclava Road
Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161

Business hours: 9.30am-3pm weekdays

Acting Federal Secretary
Peter Naish VK2BPN

Federal Office staff
June Fox Bookkeeper
Rita Trebilco VK3IF Examinations Officer

Council

President	Peter Naish	VK2BPN
VK1 Federal Councillor	Glenn Dunstan	VK1XX
VK2 Federal Councillor	Michael Corbin	VK2YC
VK3 Federal Councillor	Brenda Edmonds	VK3KT
VK4 Federal Councillor	Ross Marren	VK4AMJ
VK5 Federal Councillor	Ian Hunt	VK5QX
VK6 Federal Councillor	Will McGhie	VK6UU
VK7 Federal Councillor	Phil Corby	VK7ZAX

Executive

Peter Naish	VK2BPN
Tony Farrow	VK2TJF
John Loftus	VK4EMM
Wally Howse	VK6KZ

Federal Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Awards	John Kelleher	VK3DP
Contests	Ian Godsil	VK3DID
Education	Brenda Edmonds	VK3KT
FTAC	John Martin	VK3KWA
Historian	John Edmonds	VK3AFU
IARU	Grant Willis	VK2ZWI
Intruder Watch	Gordon Loveday	VK4KAL
ITU Conference and study group	David Wardlaw	VK3ADW
Public Relations	David Thompson	VK2NH
QSL Manager (VK9, VK0)	Neil Penfold	VK6NE
Videotapes	Don Bland	VK4TVD

ACA Liaison Team

Peter Naish	VK2BPN
Glenn Dunstan	VK1XX
Michael Corbin	VK2YC
Wally Howse	VK6KZ

Canberra Liaison Officer
Richard Jenkins VK1RJ

EDITORS COMMENT

Buzzwords

LAST MONTH'S COMMENT was going to be entitled "Acronyms and Buzzwords", but as it worked out there was enough on acronyms alone to fill the space.

So now to buzzwords.

Meaning what? For the purpose of this editorial I would define a buzzword as a technical term having at least two meanings. One may have been part of the language for centuries. The other, usually the technical meaning, has come into widespread popular use only recently.

Three not so recent examples came into being just on 100 years ago with the advent of motor vehicles. The words "clutch", "choke", and "throttle" had singular and rather violent meanings once. Not now! In those days "broadcasting" referred to a method of distributing seed on a farm. But the real trigger for the buzzword business has been computers! From the moment you "boot" your PC and chase your "mouse" over the mat you are "supporting" a "host" of buzzwords. A "hacker" may have planted a "virus" on your "floppy" so "debugging" is necessary. "Default" and "execute" have meanings never known before the 1970's. You don't obtain things, you "source" them. Not to use a noun as a verb is a "big ask", isn't it?

Hopefully? No, preferably "in hope" I guess I have now scored enough "hits" to "exit the program"; and without one mention of amateur radio. Not to say it's without buzzwords, but let's leave them until another time.

Bill Rice VK3ABP
Editor

NEW MEMBERS

The WIA bids a warm welcome to the following new members who were recently entered into the WIA Membership Register.

L31547 Mr Y U K Hang D. Tse
VK2DPZ Mr W J Minogue
VK2GPL Mr L J Mcilree
VK3AXL Mr B J Neumann
VK3BIX Mr A E Phillips
VK3BVW Mr R J Wagner
VK3TEN Mr G Pearce
VK3XIJ Mr I J Hocking
VK3ZJH Mr J Longayroux
VK4BO Mr Frank Fisher
VK4DLT Mr Donald Tunes
VK4DMI Mr D W Shephard
VK4QD Caboolture Radio Club
VK4SOA Mr So Abrahams
VK4VKZ Mr DJ Cantwell
VK4YKE Mr NL Doak
VK4ZJ Mr RJ Webb
VK4ZKR Mr KS Read
VK4GRM Mr Gregory Mews
VK4SGW Mr Stephen Watson
VK4KIY Mr N Wright
VK4BX Mr J White
VK4IL Mrs EJ White
VK4FAE Mr C Alexander
VK4FRF Mr R Frost
VK4XD Mr PD Love
VK4NH Mr MGN Hoare
VK4ZXZ Mr G Minter
VK4FNA Mr Nigel Andrews
VK4SM Mr David Soundry
VK4GBW Mr Gordon
L41018 Mr DA Middlebrook
L41019 Mr Cj Roberts
L41016 Mr Dennis Bauer
L41017 Mr Glenn Wood
L41020 Ms J H Mancy
L41021 Mr M Donohoe
L41022 Mr Roy Harris
L41023 Mr Tom Deridder
VK5AGX Mr V V Noble
VK6HAO Mr P J Larkin
VK6VAS Mr V Vasic
VK7US Mr S Anderson
VK7WM Mr W J Melville

Comment

Federal President, Peter Naish VK2BPN.

New Executive up and running

THE FEDERAL EXECUTIVE of the WIA, which was elected at the Annual Convention in May, is now well into the various tasks that need immediate attention. The two new Directors have rapidly found their feet and are contributing significantly to the work of running the Federal company.

As promised, the liaison with ACA is a high priority item. There are many matters that currently concern amateur radio operators in Australia and many of these were the subject of discussions with ACA in June. I intend to highlight the results of these in a forthcoming issue of this Journal.

On the international scene, the meeting of IARU Region 3 in Darwin in August 2000 will be an important forum to prepare the amateur radio service for World Radio Conventions scheduled to be held during the next two years. The Darwin Amateur Radio Club is hosting the meeting on behalf of the WIA. More information on this important event will be provided to you as the date approaches but already delegates from throughout Region 3 (most of Asia and the Pacific region countries) plus IARU members from Regions 1 and 2 and IARU headquarters are making their plans to attend.

A few weeks ago I was privileged to be invited to attend the Annual Conference of our sister organisation in New Zealand, NZART. This was held in Christchurch and attended by nearly 300 NZART members. Many of the issues that were raised during this conference were similar to those that are concerning the WIA. It was refreshing to be able to swap ideas on how the NZART and WIA could work together to improve the amateur radio service in our countries. I found a genuine desire to work as a team particularly in regard to international matters where a consolidated front from this part of the world will help to ensure that our voices are heard in international forums which are dominated by the large European and North American representatives.

Peter Naish, VK2BPN
WIA Federal President.

WIA News

WIA News Prepared, researched and compiled by
Assembled by Bob Harper VK4KNH
(Sources noted where known.)

WWII RAAF Site Memorial

5 Fighter Sector - Darwin

WERE YOU STATIONED at 5 Fighter Sector at Berrimah near Darwin in WWII? The wartime site of 5 Fighter Sector Headquarters, RAAF, near Darwin has been recently rediscovered (5 Fighter now known as 105). The site has been prepared by the Heritage Branch of the Northern Territory Government and will be dedicated on Friday 13 August 1999. The organisers hope that many ex-servicemen, particularly those from the RAAF, and more particularly any who served there will be able to attend. Enquires should be directed to Graham Calley, telephone 0419 300 822

(Murray VK5ZQ/vk5 news/vk4afs)

VK-News by E-mail

VK2WI News is now available by email subscription.

To subscribe to this free service, simply send an email message to: vk2news-subscribe@onelist.com

QNEWS from VK4 Division is also "on line", Send an email request as above to: QNEWS-subscribe@onelist.com.

Other divisions may be available from this site in the future so keep reading AR for details. (VK2SKY/VK4BB)

3.4 GHz Up for Auction

Parts of the microwave spectrum now allocated to the Amateur Service are planned to be auctioned this year.

A report in the June 1999 issue of Connections, the bulletin of the Australian Communications Authority, advised that the Authority is proposing a re-allocation of frequencies in the 3.410 to 3.600 gigahertz range across Australia.

Segments 3.4425 to 3.4750 and 3.5425 to 3.5750 GHz would be affected by the re-allocation. This part of the spectrum is sought after by commercial interests for Wireless Local Loop services.

A price-based allocation of licences was supported because these frequencies are considered to be commercially desirable.

Page 58 of the WIA Callbook mentions that amateurs have secondary access to 3.3 to 3.6 GHz. Radio-location is the primary user of this segment. The frequencies to be auctioned are in the middle of this amateur secondary band. (APCNews)

Note that your membership helps the WIA to fight to retain your privleges.

Gold Coast To Host International Meeting For WRC 2000

The ACA and the Department of Communications, Information Technology and the Arts will co-host the Asia Pacific Telecommunity (APT) Preparatory Meeting for the World Radiocommunication Conference 2000 (WRC 2000).

The meeting will be held from 4-8 October 1999, at the Gold Coast International Hotel, Surfers Paradise, Queensland.

Over 100 delegates from more than 29 countries within the Asia-Pacific region are expected to attend.

More information about the meeting is provided on the ACA's website: http://www.aca.gov.au/committee/international/apg2000-3.htm

Kosovan News from BBC

You may have heard the VK7 Division on their news service, called for volunteers to help set up a radio monitoring service for the Kosovan refugees in Tasmania.

Now from the UK a group of radio amateurs and social workers are monitoring

Continued on page 4

Continued from page 3

the Beeb helping Kosovan refugees, living temporarily in the UK.

Twice a weekday, BBC World Service puts out a 15-minute short wave broadcast in Albanian. These special programs go out at 11.15 hours BST 13,745 kHz, 15,415 kHz and 17,670 kHz. They are transmitted again at 14.30 hours BST on 11,680 kHz, 13,670 kHz and 15,115kHz.

Now for usVK's. If there is a group of refugees living near your home, you may find that their social workers would appreciate receiving a recording of one of these transmissions. Maybe even something our Listed Listeners could become involved in!

VK/ZL Moved Left Of Centre

APRS buffs, bushwalkers, sailors etc soon could be finding themselves lost as Australia moves its longitude and latitude grid.

Ours is currently worked out differently to the rest of the world. From Jan 1st 2000 all our mapping services will have completed the change to bring us in step with "over yonder!"

Remember that GPS already has an error margin factored in, with our change of some 200 metres where you're sitting right now could be up to 1/2 a kilometre from where you think you are! Are you confused?

Sue Buzer, president of the Mapping Sciences Institute of Australia says "the change could easily cause confusion!"

(Rodney Chester/Courier Mail)

Beacons/Repeater Callbook Details

John VK3KWA says he's begun the update of the beacon, repeater and packet BBS directory for the 1999 - 2000 Call Book. Any additions or corrections to the list would be much appreciated.

The information needed for packet systems is:

- Callsign, location and service area.
- Type of system: one or more of:
  B BBS D digipeater G gateway N node
  R Rose switch S Satgate W wormhole.
- Frequencies, and baud rates for each frequency.
- And, if possible, ERP, height of station above sea level, and name of sponsor (if it is a club or group).
- You can also add other information which can be put in a footnote.

Information by mail to WIA (Callbook), PO Box 2175, Caulfield Junction Vic 3161.

Speaking Of Beacons

The VK4RTL beacon has been heard in VK3. The beacon on 28.270 MHz is operating under test from the QTH of Les VK4ALS. APC News confirmed the operation and said it was heard quite strongly in Melbourne recently. Reception reports are still invited and can be sent to VK4ALS.

WIA Callbook for 2000

Have you checked that your details on your licence renewal are correct? If not they will be listed in the callbook as they appear on the ACA database. Please advise the ACA of any changes ASAP.

The contents will soon be gathered for the next callbook. If you have any suggestions for content that should be included please forward your ideas by mail to WIA (Callbook), PO Box 2175, Caulfield Junction Vic 3161.

Anything To Declare?

The ACA has added a new fact sheet "bringing communications equipment into Australia" to its website.

The fact sheet provides general information about how to properly and legally use any communication equipment brought in from overseas.

Communications equipment purchased overseas generally needs to be tested to see if it meets Australian regulatory requirements, and this process can be costly and time consuming.

Anyone thinking of bringing such equipment into Australia should check these requirements first. The sheet provides some general information for visiting amateur radio operators and about the operation of other radio-communications equipment.

The fact sheet is on the ACA website at: http://www.aca.gov.au/consumer/fsheets/index.htm

(aca connections)

Off To A "Rocky" Start

VK4YOL Jason and VK3TJN Bruce along with the Australian ARDF team have landed in Korea for the amateur radio direction finding championships, however the trip was not without drama.

When Bruce arrived in Sydney, he realised he had left his passport at home. Fortunately another ARDF articipant, Jack VK3WWW, a locksmith by trade, was still in Melbourne and was able to retrieve Bruce's passport from his home!

Later on Bruce found that some antenna elements had been left in his brother's car. Again these were rescued just in time for the flight to Korea. We hope to have more news on how the Australian team goes in Korea and perhaps the full story in AR soon.

(VK3TJN/apcnews)

ACA News

Roger Smith, formerly Senior Executive Manager Planning and Standards at the ACA, has recently taken up a position at the International Telecommunication Union (ITU) in Geneva, Switzerland as Head of the Space Services Department in the Radio-communication Bureau of the ITU. This Department is responsible for managing International Treaty obligations for the notification, coordination and registration of all national and international satellite systems.

In the past, Roger's responsibilities at the ACA included international radio-communication matters, and he represented Australia at ITU Conferences, meetings and working groups, including chairing the ITU World Radio-communication Conference (WRC-97) in Geneva. Mr Smith has been active in international communications work over many years.

(Connections)

WICEN

Ray Sweatman VK4KV, President of Brisbane area WICEN believed VK4 to be the only place in the world where competitors' scores are flashed to Rally HQ by packet radio. The scoring program was written by Brian Mennis VK4XS.

After QNEWS broadcast that story, Peter VK2ETK in Orange and Editor of that club's magazine contacted QNews to say:-

"Can't possibly let that one go by without firstly, a correction and secondly, a reminder of a piece of ham radio history.

I hope VK4KV does not mind being corrected on his reported belief. Blue Mountains Region of WICEN (NSW) is just one of several VK2 groups regularly using packet radio for these purposes. This is from the Orange Radio club, one of VK's more progressive clubs."

"The reminder about a bit of amateur radio history concerns the very early use of packet radio for just that purpose! The Qantastic 2-Day Motorcycle Trials were run in various forests around Orange NSW in from 1975 to 78.

Local hams used 2m FM, plus some HF, in all of those, with the 1977 and 1978 events also using a sort of packet, slowly chirping competitors' scores (hardly "flashing" in those days), from

Field Control to HQ. The software was written the hard way, just about at the machine-language level, by Kim Stevens VK2ICP (then 2ASY) and Wally Watkins VK4DO (then VK2DEW)."

"While Orange mightn't have been the first, we were very early off the mark, before networks of nodes and digis existed. There's been talk of re-introducing packet and trying ATV for future suitable events in Orange.

The ease of operation, the speed, accuracy and overall success of packet radio is far better now with much improved hardware and software, compared to what our Orange guys did, let it be known, almost a quarter of a century ago."

Amateur Radio Is At The Crossroad

"*Amateur Radio is at the cross roads!*" says SARL President Hans Potgieter.

"*Taking the low road is easy, we just let things slide and allow fate to take control of our destiny*", he said.

"The high road will not be an easy road. There are many obstacles on the way. Many of us that believe that the ITU and SATRA will protect our frequencies, that the American FCC will keep the small satellite industry at bay and all is well. How foolish can we be to believe that?"

"The warnings from Robert Jones, Director of the ITU Radio-communications Bureau and the Chairperson of the ITU Council, Lindall Shope Mafole can not be taken lightly.

Automated receivers connected via satellite and the Internet are monitoring the amateur bands for spectrum occupation and content of communication. Would you put your weight behind the Amateur lobby based on what those studies reveal? I somehow doubt it.

We are back to the old argument, unite by joining the SARL (WIA here). Joining the SARL is not a question of who you like or dislike on Council, it is a question of survival, survival of the Amateur frequency allocation and the service," President Hans said.

Contest Time

To celebrate the 25th anniversary of the Ontario DX Association listeners of international short-wave, medium-wave, FM, scanning and Amateur Radio are invited to write an essay on *"Radio in my life"*.

Tell ODXA about the importance of radio to you, how it has contributed to your life, why you love radio... share your emotions and passions with other radio listeners around the world in 1000 words.

ODXA say ALL essays will be published in a booklet to be available at Radio Fest 99, September 24-25th in Oakville, Canada and all entrants will receive a complimentary copy of the booklet. Copies will also be made available to other radio clubs, publications and international radio stations, as chosen by the Ontario DX Association.

Essays must be received no later than September 1, 1999.

E-mail to: dxontario@compuserve.com

Mail to: Ontario DX Association, P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada.

Arthur C Clark and Y2K

AMSAT member 2001 has a lot to say about Y2K. Arthur C Clarke, author of "2001: A Space Odyssey," and AMSAT member 2001 feels so strongly about people calling next year a new millennium that he issued a public statement to correct them.

According to Clarke, because the Western calendar starts with Year 1, and not Year Zero, the 21st Century and the Third Millennium do not begin until January 1, 2001.

He says that while some people have great difficulty in grasping this concept, there is a very simple analogy to explain it. He asks if the numbers on your grocer's scale were to began at 1 instead of 0, would you be happy when he claimed he'd sold you 10 kg of tea?

Clarke says that the same is true regarding what is and is not the real Y-2-K. He says that we will have had only 99 years of this century by January 1, 2000. We will all have to wait until December 31, 2000 for the full hundred.

(Y2K Science Watch/newsline)

ar

Are you a *doer* or just a reader?

today!

project

an Amateur Radio Build

Andrews

Communications Systems

(EST.1976 - ACN 001 968 752)

ALINCO

AUSTRALIA'S FIRST AUTHORISED FACTORY DIRECT IMPORTER

No1 & Biggest Importer with one or two absolutely massive shipments monthly.

FULL 3-YEAR FACTORY WARRANTY

INSTANT REPAIRS ON FRIDAYS

WE SELL MOST BRANDS AND MAKE BALUNS, VERTICALS, YAGIS, P/S. ICOM-KENWOOD-JRC-AOR-EMOTATOR-MJF-DIAMOND-TIMEWAVE-KANTRONICS -THP - GARMIN - TERLIN - UNIDEN -ETC

DX-1600 HF LINEARS FROM $ 3,799

HUGE RANGE OF ELECTRONICS

NEW IC-706IIG & IC-756PRO

NOW 3-YEAR WARRANTY ON NEW ICOM SOLD BY US.

* OVER 20 YEARS OF SERVICE *

WE WANT HF SSB TRANSCEIVERS & LINEAR AMPLIFIERS

(02) 9636 9060 or (02) 9688 4301

SHOP 8, 41 BATHURST ST, GREYSTANES, N.S.W. 2145. FAX (02) 9688 1995

Looking for an Olde Valve?

or a new Valve ?

AMATEUR RADIO - AUDIO - INDUSTRIAL AND VINTAGE RADIO

plus electrolytics, sockets and books

BUYING - SELLING - TRADING

Australasia's biggest selection

Send a SSAE DL Envelope for your free catalogue

ELECTRONIC VALVE and TUBE COMPANY

PO Box 381 Chadstone Centre VIC 3148

Tel: (03) 9571 1160 Fax: (03) 9505 6209

Mob: 0417 143 167

E-mail evatco@mira.net

Divisional News

Divisional Notes for July 1999 contain some material that was unfortunately left out of the June edition. The problem has, hopefully, been corrected and it is not expected to happen again. I apologise for this failure and encourage all divisions to use this facility to reach their members. One division has told me that AR reaches more members than any means other than a direct mail-out. How would your division compare?

WIA Victoria News (for June, 1999)

By Jim Linton VK3PC

The WIA Federal Convention

The annual general meeting of WIA Federal was held in Sydney, or more precisely, Parramatta, on the first weekend in May. The delegates for VK3 were our Federal Councillor, Brenda Edmonds VK3KT and the Alternate Councillor, myself Jim Linton VK3PC. The first matter raised by the VK2 delegate was the eligibility of WIA Queensland to participate in the convention.

The VK2 delegate, Michael Corbin VK2YC, argued that under the articles of association, a member division of WIA Federal had to be financial to participate in the Federal Convention. VK4 was not a financial affiliate of the federal body.

VK3 agreed, and seconded VK2's motion that VK4 be excluded from the meeting. The motion was passed and VK4 was excluded from participating, however a subsequent motion permitted the VK4 delegates to remain and observe the proceedings, which they did. VK4 remains a member of the WIA, and the complex issue of membership dues is being worked through to find a solution.

In today's report to WIA members I will mention a number of agenda items of interest.

Two motions concerned Morse code licence qualifications. VK5 proposed that the Morse code test speed be 5-words per minute for the AOCP standard, while in a second motion VK6 called for Morse code to be removed as a licence requirement.

These motions were not carried. VK3 argued that any WIA policy on Morse code should reflect the wishes of the members of the WIA Divisions – and that another survey needed to be held. During debate it was also pointed out that the issue of Morse code is currently being considered as part of the international review of Amateur Radio qualifications being undertaken by the International Amateur Radio Union.

VK5 in another motion proposed that individual radio amateurs be permitted to openly advertise equipment on the air – the motion also failed. VK5 also proposed increasing the size of the Novice CW segments so they could more easily communicate with full call licensees. The motion failed.

During the conference there was considerable discussion on the operation of the WIA ACA Liaison Team. The delegates universally agreed that this important WIA activity needs more publicity so everyone can learn about the progress, or lack or progress that is being achieved regarding issues under consideration.

The WIA Federal Council also increased the federal component of WIA membership fees – these cover two areas, International representation, and a so-called catch-up for Pensioner G-Grade members for the cost of AR magazine.

In relation to the increase for the G-Grade members, your VK3 delegates did not vote in favour of this impost, and registered a protest about the proposed fee rise. The fee increase first suggested more than a year ago was aimed at standardising the cost of AR magazine to all members receiving the publication. WIA Victoria is now seeking to convince the other Divisions that the fee rise is not justified because of the cost savings in the production of AR magazine under its new production contract.

The Convention also decided that the Year 2000 IARU region 3 conference will be held in Darwin – previously Queensland's Gold Coast has been considered as the venue. The conference will be coordinated by the Darwin Amateur Radio Club team that has run two successful SEANET conferences.

The delegates chose some new blood for the WIA Federal Board of Directors – with the Federal President, Peter Naish VK2BPN being re-elected along with Wally House VK6KZ, and the new directors are John Loftus VK4EMM and Tony Farrow VK2TJF.

In other major appointments, Bill Rice VK3ABP continues as AR magazine editor headed to set a new record in the editor's chair. There is already some interest expressed by a couple of aspirants in the editorship...when Bill retires.

Gordon Loveday VK4KAL the Federal Intruder Watch Coordinator was also nominated as the IARU Region 3 Coordinator.

Jack Bramham VK3WWW was appointed the WIA ARDF National Coordinator.

Amateur licence fees - no change

A review of all licence fees set by the Australian Communications Authority has not increased the fees of amateur licences. A new scale of fees effective from the 10th of May listed all categories of amateur licence at $50.

Although the ACA has made changes to the Spectrum Access Tax, Spectrum Management Charge, and Licence Issue or Renewal Charge - the total sum still adds up equal to the fees set last year. While amateurs have escaped a licence fee rise, that has not been the case for all types of radio-communication licences issues by the ACA.

It does seem that the ACA has accepted the arguments put to it by the WIA against higher licence fees for amateur stations.

International Telecommunication Day

To mark International Telecommunications Day, Monday 17 May, the commemorative callsign AX3ITU was put to air. The occasion celebrated the 134th birthday of the world regulator of telegraph, telephone, radio and satellite communications, the International Telecommunication Union. On May 17 each year is it traditional to hear amateur special event stations denoted by their ITU callsign suffix.

Among them was AX3ITU, assigned to WIA Victoria and enthusiastically activated by a team of five members of its affiliate, the Eastern and Mountain District Radio Club who made 310 contacts.

Further discussions on proposed new Amateur Operator Licence

The WIA is still lobbying for the uniqueness of amateur radio to be recognised by the establishment of a new type of licence. The basis of its argument is that the current types of licence available under the Radiocommunications Act - Apparatus Licence, Spectrum Licence, and Class Licence - are not suitable for the nature of amateur radio.

The WIA believes that radio amateurs don't fit into those types of licence because they are qualified by examination, do not require type-approved equipment, and are frequency agile within amateur bands.

The Department of Communications, Information Technology and the Arts (DOCTA) is seriously considering this matter as it reviews the Radiocommunications Act.

There is clear indication by the nature of follow-up contact between DOCTA and the WIA, that the Department appreciates the logic and merits of the WIA's submission on the issue.

Upcoming events calendar

Gippsland Technical Conference

The 2nd annual GTC will be held on July 10-11. This conference looks at the specialised communication techniques, operating methods and propagation applicable to the VHF, /UHF and Microwave spectrum. It will be held at Churchill about 170km east of Melbourne. For more information contact Peter Freeman VK3KAI 03 5122 6416.

Shepparton and District Amateur Radio Club Hamfest

Sunday September 12 at the Shepparton Youth Club Hall behind the High Street Safeway complex. Traders begin setting up at 7am with the doors opening to buyers at 10am.

Jamboree On The Air - JOTA

Saturday 16 Sunday 17 October, the annual Jamboree On The Air which began in 1958 will involve more than 400,000 scouts and guides around the world "getting together" via amateur radio.

Qnews - VK4 Notes

by Alistair Elrick VK4FTL

WIAQ Councillor and QTC Editor

I must apologise for the non-appearance of this column last month; a glitch in procedures led me to believe it had been forwarded for inclusion, when it had not.

It has been stated by several attendees of the Federal AGM, that the atmosphere was friendly and positive, this despite the exclusion of the VK4 Federal Representative from voting. This came about due to the frustration of many people on the extended debate and inconclusive records of the facts of the matter. Throughout this, all parties did what they believed to be correct by what evidence they had before them. But looking back many would have done it all differently. The conclusion is in sight and we can then, each and every one, turn our energies to the more important matter of ensuring the survival of the Amateur Radio hobby. This can come from raising the profile of AR in the public arena.

The increased activity of many clubs in VK4 bodes well for increasing the interest in Amateur Radio. The increase in 'local' activity makes Amateur Radio more visible to people who may see the hobby as an interesting and enjoyable challenge.

I listened recently to a conversation on a local repeater between a long time Novice licence holder and a recent CB convert (now a Novice). Both determinedly looking at the upgrade to Full Call as a challenge. They are going to attend classes at one of those clubs with a recently increased profile. There must be more candidates out there to attract into the hobby, so get out into the public arena and promote that club image.

Upcoming events which fall into this category are the North Queensland Amateur Radio Convention on from Friday 24th to Sunday 26th of September at the James Cook University Townsville. John VK4MAV is the contact for this one on (07) 4789 1796 or by packet to VK4MAV @ VK4RAT.#NQ.QLD.AUS.OC.

The Central Highland Amateur Radio Club have their annual 'get together' at Lake Maraboon (Fairbairn Dam) near Emerald on the weekend of 4 - 5th of September. Accommodation can be booked for you at the Maraboon Holiday Resort, so contact Gordon VK4KAL on 07 4982 3677 or fax 07 4982 1932 or by mail to PO Box 761 Emerald 4720.

John VK4AFS called for June to be 'Someone Month'. That is, there are many jobs to be done by 'someone'. So even if you can't take part in the Council or WIAQ activities full-time, then part time is still OK. Volunteer no matter who you are or what your particular talent is. You can always help somebody, get to know fellow amateurs and see what they are doing for the amateur community in your area. Any month can be a 'Someone Month' and your help will be appreciated. Contact the office on (07) 3221 9377.

Recent WICEN activities for a car rally in the forests to the north of Brisbane in the Sunshine Coast Hinterland, brought forth the usual favoured conditions for camping, rain, rain and more rain. It was also a bit cool and windy by all reports. Nevertheless, the activity was a success and once again proved that Amateurs are a hardy lot and I am sure the event tested the resolve and the equipment of those dedicated volunteers who participated. Well done to all.

Moving to Queensland's Sunshine Coast? If you're a Ham make sure you bring your chequebook. Current Caloundra City Council fees for antenna installations seem higher than the tower itself! How about $300 as a "development fee", $180 to "advertise" the development and $20 for a council sign. No this is NOT for a "monster tower" just an 11 metre Nally. (Wonder what Doug and June did with the 2.7 metres cut from the stock standard Nally?)

Bayside AR Society President, Jim VK4WJG 'fossicked' through the callbook and came up with around 100 names and addresses of Hams in their club area! A letter of invitation to attend a club meeting has been planned, club members are "oiling their chains" in readiness for a bicycle letterbox drop shortly! Listen in to QNEWS Mondays at 7 PM, followed by callbacks and the Clubs' popular net on the 2-metre repeater at Alexandra Hills, 146.875, or HF net Wednesday 7:30pm on 3.567 MHz, an easy one to remember. 3-5-6-7.

Commencing Sunday July 11 the Redcliffe Club will be opening on the second Sunday of each month from 9.00 AM to 3.00 PM for a Family and Radio Shack day. The equipment will be fired up and Redcliffe will be on air on HF, VHF and Packet etc. The WIAQ QSL Bureau will be open for business and so will the grounds for impromptu cricket, football or whatever. And how's this! If you live a long way away, but would like to come, you can camp in the Clubhouse. Refreshments will be on sale or you can bring your own BBQ/ picnic lunch! The day will be an open day for everybody and you don't even have to be a member. So bring along your family and friends, with your children being most welcome.

VK6 Notes

Chris Lowe VK6BIK

Unfortunately last month I overlooked reporting on the Divisional AGM, one of the more significant events on the VK6 calendar! However, I will summarise both the AGM and the latest Council meeting this month, since there were several interesting matters arising, and not all members have access to packet or the Internet.

Continued on page 8

ROCOM COMPONENTS

***SURPLUS** ELECTRONIC COMPONENTS AT **CHEAP CHEAP** PRICES*

INCLUDING:

Intergrated Circuits
LCD Displays
Transistors
Diodes
LEDs
Books
Connectors
Switches
Transformers
Fans
Relays
Speakers
Terminals
Resistors
Buzzers
Leads
Knobs
Heatsinks
Hardware
Capacitors
Batteries
Motors
Computer Accs.
Fuses
Triacs
Potentiometers

FOR A *FREE* MONTHLY MAILER PLEASE CONTACT US

Store Address: 56 Renver Road, Clayton, Victoria 3168
Postal Address: Bag 620 Clayton South, Victoria 3169
Phone: (03) 9543 7877 Fax: (03) 9543 4871
Website: http://www.rocom.com.au
Email: sales@rocom.com.au

Continued from page 7

Divisional AGM

This was held on 24/4 at the RSL Centre in E.Vic Pk. After the President's annual report, the Treasurer advised that the balance sheet returned a small loss of $80.25 for the year if interest from investments were taken into account.

The Intruder Watch report again referred to the very large number of intruders now evident in 28 and 7 MHz from Asia. The bottom end of 7MHz was "a disaster". More reporters were always welcome, reports being received from only two sources this year.

WICEN monthly meetings are now held at scout headquarters, but as the venue is up for sale, another forced move may be imminent. Weekly nets on 80 and 2 metres are well patronised. Only two community events, The City to Surf Fun Run and Rally Australia, were serviced this year. The demand for WICEN services for these events had declined with the advent of the Cellphone service.

The Broadcast officer reported that NewsWest averaged 100-150 callback reports each week. The current format is to be retained, but suggestions for change are always welcome. NewsWest is available as audio on the Internet via the VK6 Home Page. The Membership officer reported a disappointing steady fall in membership numbers, despite a number of new recruits. The average age of members is increasing.

The Federal Councillor briefly discussed the coming Federal AGM, outlining several topical issues to be raised. Patron: the Governor of Western Australia has agreed to continue as Patron while he remains in office. Council: As only eight nominations were received for nine vacancies, a ballot was not required. The following were therefore declared elected: Cliff Bastin VK6LZ (President), Councillors as follows; Dave Wallace VK6IW, Neil Penfold VK6NE, Tony Savory VK6TS, Will McGhie VK6UU, Keith Bainbridge VK6XH, Christine Bastin VK6ZLZ, Don Graham VK6HK. Eddie 6ZSE was accepted as Councillor to fill the casual vacancy.

Minutes of Council Meeting 1st June

The matter of the RAOTC request for action towards achieving a pensioner discount on licence fees was discussed. Some years ago an earlier Government had concluded that because AR was not in the category of an essential service, a discount was not in accord with policy. It was suggested that contact with the State Government Office of Seniors Interests might produce some useful advice on the likelihood of success today.

Tony VK6TS reported on a meeting held at Wireless Hill attended by Phil VK6AD and Terry VK6ZLT with representatives of the Melville City Council. The City is keen in having a working AR exhibit set up at the Museum. There is a large quantity of historic equipment in storage, which will be the subject of another meeting to assess. The old residence might become available for AR purposes. There is also a large quantity of historic photographs, QSL cards etc. Tony considered that such a project represented a good opportunity for favourable publicity and will follow the matter up. *(Very interesting - I don't know the full detail of this, but it sounds like it has the potential to end the search for "permanent" premises for AR in WA, while at the same time providing a win-win situation for all parties).*

Two new members, Ebbie Lucas VK6DJ and Harry Butler VK6BSW, were welcomed to the Division. The Federal Directors have advised that there will be some increases in fees commencing 1st January 2000. The rises are due to IARU levy in 2000 and in 2001, and an International levy for 2000 only. *(I'm sure it will be possible to obtain more details from Councillors at the on-air meetings).*

Broadcast: Tony VK6TS advised that the 29 MHz FM outlet had been attracting callbacks from Eastern VK. Volunteers are being sought to fill the position of Education Officer. The possible extension of the 80m DX window was again discussed. This is likely to become the major topic in one of the on-air meets soon. Will VK6UU advised that the Home Page has now been moved to the new provider (Omen). He also suggested that a telephone number be included as a reporting point for the monthly WIANET as a service to people unable to call in on air. Cliff VK6LZ and Christine VK6ZLZ agreed to the use of the Secretary's telephone (9351 8873) for this purpose.

A proposed new repeater site obtained by WARG in Victoria Park, will probably be developed to improve 70cm coverage in the City area. It was advised that there had been some complaints about poor WIA news coverage via the 6700 repeater in the Northern suburbs, and suggested that people should try the 6100 VK6WIA input signal, which is originated from a favourably elevated site in Doubleview.

A motion was passed to nominate Neil VK6NE for the G.A. Taylor medal, for meritorious Service to AR.

The meeting closed at 2250 hrs *(lucky we don't have to pay our councillors penalty rates !).*

73 for now, Chris VK6BIK
(chrismor@avon.net.au)
ar

CLUB NEWS

Notice to all clubs

AR will gladly post your event details but we ask that a few simple guidelines be followed:

- Use a club letterhead or email address where possible.
- Supply contact details in case your notice needs any clarification. A name and phone number or email address should always be supplied.
- Keep the details that you want published separate from the covering letter, eg a separate page or identified paragraphs.
- Place all the details that you want published in one section including a contact name and number.
- Try to make the details interesting to all the readers -not just in house stuff please.
- Always start with a title for your piece or the club name. Remember that there may be other clubs with the same initials and there are several towns that appear in more than one state.
- Always finish with the name and callsign of the writer.
- Most importantly always date your submission and tell us when you require it to be printed.

Help us to help you.

Riverland Radio Club AGM

At the Annual General Meeting of the Riverland Radio Club, the following members were elected to the committee.

President Ray Hutchison VK5ZAI, Vice President Adrian Reimann VK5AJR, Secretary/Treasurer Doug Tamblyn VK5GA, Committee Neil Francis VK5ANF, David Wilson VK5NAP, Ivan Smith VK5HS and Malcolm Gardener VK5UBT.

Check out the Riverland Radio Club details on the Murray Pioneer Home page at http://www.riverland.net.au.

The North Queensland Amateur Radio Convention is on!

Friday evening September 24th to Sunday afternoon September 26th at the James Cook University, Townsville

If further info is required, please contact the convention coordinator, John VK4MAV packet VK4MAV@VK4RAT.#NQ.QLD.AUS.OC or phone (07) 4789 1796. All visitors are welcome to the tropical North. (VK4ZZ)

Sunshine Coast Sunfest

The Sunshine Coast Amateur Radio Club will be holding their bi-annual event this year on the 28th of August at the Nambour Showgrounds. Table and display space bookings to Angus (07) 5443 2074 or write to the SUNFEST Coordinator, 285 Main Rd Maroochydore. 4558. Tables are available at $15 per table and as space is at a premium SARC are asking for firm bookings by 31st July.

Ipswich and District Radio Club

The Ipswich Radio Clubs new 2 metre to 80 metre linked cross band repeater system is working just fine.

The President of Ipswich and District Club, Ken Page VK4AKP says "it's proving a boon in encouraging more of the clubs amateurs to take part in the net. VK2AB mobile near Canberra praised our efforts of making the 2m net more interesting and accessible. VK2AB reported that he could hear all of our members linked from the 2m repeater. He was so impressed with our efforts that he said he would love to join in again if he was mobile next week!"

Club net Frequencies & Times. -

Tuesday Night's 7:30PM.
146.725MHz -Neg Offset VK4RKP Mt Crosby.
3.585MHz +- QRM.

Riverina Field Day

The Wagga Amateur Radio Club presents the Riverina Field Day on the 7th & 8th of August 1999. The Riverina Field Day is held annually and is held alternately in Albury and Wagga Wagga. As the 1998 Field Day was hosted by the Albury Club in 1998, it is Wagga's turn in 1999.

The Field Day is a get together for Radio Amateurs and enthusiasts with a dinner on the Saturday evening and the field day proper on the Sunday being held at the Kooringal High School Gymnasium. There will be trade displays of new and used equipment, lectures on radio related topics, private trading tables for disposal of equipment, talk-in and hidden transmitter hunts.

Details of the program, dinner, available accommodation and map of the location of Kooringal High School are available on the club's web page at http://hamgate.wts.com.au . Alternatively contact may be made with John Eyles VK2YW on Phone (02) 69265471 H or (02) 69332363 BH or via E-mail to jeyles@csu.edu.au.

The North-East Radio Group NAOCP Classes

NERG will again be holding classes for the NAOCP. commencing early August and running on Tuesday nights for approximately 11 weeks followed by a trial exam. The exam proper will be held a few weeks later at a time convenient to candidates and examiners.

Printed notes on various topics and Morse tuition is included in course fees which are once again only $100. For further information please contact Stephen Warrillow on 9436 7273, at PO Box 416, Rosanna VIC 3084 or at swarrillow@hotmail.com
Get your News in to AR for next month's edition.

ar

TARC Welcomes Brisbane Visitor

TARC welcomed Jason Morris VK4YOL to their Monday night meeting when he visited Townsville in April this year. Jason is participating in the Region 3 ARDF Championships in South Korea as this is being written (June). Although Jason was there on other business, TARC turned the tables on him donating $100 toward his costs. President Don VK4MC is pictured handing over the cheque to an embarrassed Jason.

Hopefully Jason will return with a big Jason type smile, perhaps a trophy, a few photos and a lot of stories that he will hopefully share with us all.

ALARA

Christine Taylor VK5CTY
ALARA Publicity Officer
16 Fairmont Avenue, Black Forest SA 5035
Packet: VK5CTY@VK5TTY

Annual General Meeting

As usual our Annual General Meeting on the 4th Monday in May was very well 'attended' with 15 callsigns recorded. We welcome all new members on to the committee and wish those who have 'changed hats', Good Luck in the new positions. Thanks to those committee members leaving us this year. We were fortunate this time to be able to fill all the positions that were vacated and even to have offers from other willing to serve. Thanks. We will remember you another time when we need you.

Two Silent Keys

As Publicity Officer, I am always sorry to have to tell you of our SKs, and unfortunately there are two of them this month. Raedie Fowler and Ivor VK3XB. Both of these people were part of the earliest days of ALARA. Raedie was almost a foundation member and Ivor was an enormous support to Mavis VK3KS, our Life Member, in everything.

These two messages were sent to me by Bron VK3DYF. I print them as she wrote them. She knew both people well.

"I regret having to advise the passing of Raedie Fowler on 27th April last after a short illness. Raedie was the XYL of Ray, VK3BHL(SK), who supported her involvement in LARA (as it then was) from when she joined in 1976.

Although Raedie never attained her licence, she was an enthusiastic supporter of our Association and she held the position of Vice-President of LARA, November 1978 to July 1980, when she became Acting President at a time of problems within LARA.

When ALARA celebrated its 10th birthday in July 1985, Raedie helped Bron VK3NTD (now VK3DYF) the VK3 State Rep, to organise a party at the Moorabbin Radio Club rooms where her OM Ray was a member. She was also one of the organising group for the surprise party given to Mavis, VK3KS, to celebrate her 50 years on air.

From 1987 to 1994 inclusive, the VK3 girls held each ALARA birthday party at Raedie's Glen Waverley QTH where Raedie and Ray were excellent hosts. Later, monthly lunches, including the birthday celebrations, were held at a cafe in the city and Raedie attended until she was no longer able to travel into town.

VK3 girls, in particular, will miss her. The sympathy of all ALARA members is offered to Raedie's children and grandchildren.

Vale Raedie.

Bron VK3DYF,VK3 State Rep."

-and-

"ALARA regrets advising that Ivor VK3 XB, the OM of Mavis VK3KS, became a Silent Key on 22nd May last.

The term 'silent key' is very apt when applied to Ivor, as using Morse code was a great part of his amateur radio operation. Ivor attained his licence in 1934 and, through the number of organisations he belonged to, became well known and respected throughout the world.

Many of our members will be aware of the support Ivor gave ALARA right from its inception. He entered all our Annual Contests, giving out most welcome points in both SSB and CW. On the nights when Mavis was to be Net Controller, Ivor always occupied the frequency early with anyone who wanted to talk, till it was time for Mavis to take over. He was very proud of Mavis' involvement in amateur radio in general and in ALARA's aim to encourage women's interest and active participation in amateur radio.

Bron's personal comment: Ivor was always the courteous gentleman even when my sending of Morse code was 'badly spaced'. He will be missed.

Our condolences go to Mavis VK3KS, ALARA Life Member.

Gwen VK3DYL and Bron VK3DYF on behalf of all ALARA members."

ALARA At The Hamfest Of The M&DRC

This year ALARA was officially represented at the Moorabbin and District Radio Club Hamfest by Pat VK3OZ, Gwen VK3DYL and Jean Shaw (our Awards Custodian). They had copies of the ALARA Award and the certificates issued for section winners in the ALARA Contest as well as photographs of our gatherings and information about us in general.

How many people only stopped because they heard the catch phrase "This is the only stall where you don't have to spend money" I don't know, but I do know that all who stopped were interested to hear about us and to have a chat. The sponsorship scheme whereby we extend the hand of friendship across the world to other YL groups was well illustrated by the badges and magazines we had on show.

Both Pat and Jean have been to ALARA lunches held in Adelaide as they both have/ had families here. Pat tells me that she will no longer have that excuse to visit Adelaide as her son and family have now moved across the border. This is VK5's loss and VK3's gain.

Thanks for the note, Pat, enjoy having your family closer.

Some VK5 News

Many of you know Maria VK5BMT and her OM Keith VK5MT, through the Travellers' Net so you may be interested to know what they are doing now. They have sold the caravans and bought a boat. They both enjoy "messing about in boats" so that is what they do.

They used to do a lot of fishing, too, but not any longer. Recently they had a marvellous day. They went out for a trip and when they stopped to enjoy the peace and quiet they threw a line over the side just for fun. The line was hardly in the water when there was a fish on it, and another, and another. By the time the fish stopped biting a couple of hours later, they had hauled in nine dozen lovely mullet. When they caught the first fish they were alone on the water, by the time they left there were boats all around them - none of whom were doing as well as Maria and Keith.

Tired but happy they headed for home to clean and fillet the fish. Each meal of fish will remind them of that gorgeous day all over again.

Maria has a daughter in Melbourne and another one overseas with whom she has regular contact through email. I can remember when she first told us about her efforts with a computer. Now she is an expert, and loves it!

Deb VK5JT is busy planning two new projects. She is learning about ATV and intends to celebrate ALARA's birthday with a broadcast, in about July, about us. Then, in October, she is getting married again. She will wed Udo VK5KAZ who is currently active in VK5 ATV circles. We wish them both well.

ar

OVER TO YOU

Band Plans

Band Plan. What a good idea. The first essential is to compose a set of guidelines to "ensure that all modes have their fair share of spectrum space" and "They should take the popularity of each mode into account". Further "The aim must be to think ahead". Recognising that this is a voluntary or "Gentlemen's agreement", we should have regard to the amateur's code. "He keeps his station abreast of science" and "kindly assistance co-operation and consideration for the interests of others".

With these ideas in mind let us look at the Band Plan.

160m all the way through to 12m CW the whole band.

10m CW more than half the band.

6m CW more than half the band.

2m CW Nearly half the band and where is the slow Morse transmission? Smack on 144.950 MHz, the frequency specifically allocated for space communication ONLY!

80m Even with the first 35 kHz exclusive to CW where is the continuous slow Morse transmission -of course on 3.699 with total disregard for other modes.

The Band Plan idea is great but it seems to have fallen into the hands of a selfish special interest group, who prefer obsolete technology.

Brian Weiley VK2AZW
13 Bourne Blvd
Nelson Bay 2315
(02) 4984 2419

Five Year Licence

I note with interest the item from VK6NE, re the 5 year AR licence renewal fee for $168. (April AR P30)

I have just renewed my unrestricted AR licence in Brisbane for 5 years at a cost of $214. ACA here says that is the cost . End of Story. (I tried last year for a five year licence and was told they were not available)

I have heard licence renewal costs vary according to population density and spectrum demand. Does this mean that a 5-year licence would be dearer in Sydney or Melbourne?

I would expect the cost of AR licences to be standard across the continent. Has anyone any ideas why this is so?

George Down VK4XY
PO Box 90
Petrie Q 4502

Morse No More?

The Editor of the newspaper, the "Midland Echo", having a large circulation in several suburbs of Perth, very kindly publishes many of my "Letters to the Editor".

The recent demise of the Morse Code, as a means of much communication, prompted my thoughts to inform members of the public of the occasion, through this particular channel, and the letter below appeared in a recent issue of the "Echo", to the satisfaction of not only many of the local Hams, but I also received interested comments from friends and other people. It was welcome publicity for our hobby.

The Passing of an Old Friend

At midnight last Sunday, January 31st. Mr Samuel Morse's Code, "invented" about one hundred and fifty years ago, ceased, world wide, for use in communication purposes and the event was marked by many a moving final Morse transmission, the messages ending in "QRT", meaning "end of transmission, station closing down".

Countless thousands of lives have been saved, by land, by sea and in aviation, by this simple and reliable method of "di di di dahs" and few do not know the code for "International Distress" SOS, appropriately. "Save Our Souls".

Modern Information Technology, with its orbiting satellites, has not, however totally usurped the delightful rhythms and harmony of this simple carrier of intelligence, as it will be used to ensure the safe operation of many navigation beacons to assist air navigation etc.

It will also live on in the activities of Radio Amateurs, who delight in achieving the necessary skills in operating the code, for the continuation of their world-wide friendships established over many years past.

To the memory of Samuel Morse, we "Hams" offer grateful thanks for enriching our hobby and our lives.

Hang up our morse key?? Never!!

Sam Wright VK6YN
19 John Street
Gooseberry Hill 6076

Not My Cards!

Recently I have received a few QSL cards to my call sign, VK4DA, for QSOs I have never made. Perhaps this resulted from QRM etc. Knowing how most DXers look forward to the QSL card, I list below the cards in the hope that the owners may recognise them (from their logs) and contact me either by phone or post. I will gladly post the card on to them.

VU-0020 CW 21MHz Feb 24th 1998.

6K98WCX CW 21MHz Oct 8th 1998.

JA0TJV SSB 14MHz Feb 22nd 1998. Addressed to Wally

KP4ER SSB 14MHz April 22nd 1999. Addressed to Peter.

My phone number is (07) 4152 5045

L Hawkins VK4DA
15 Coomber Street
Bundaberg Q 4670

Send your letters to
Over to You
PO Box 2175, Caulfield Junction Vic 3161
email armag@hotkey.net.au
Fax (03) 9523 8191

SNIPPITS

In 1909 the Eiffel Tower was destined for demolition but was saved by the fact that it supported a radio antenna that was considered vitally important to French telecommunications.

The Classic Adelaide Rally

Christine Taylor VK5CTY
16 Fairmont Avenue, Black Forest SA 5035

The communications for the two Classic Adelaide rallies have been provided by the local amateurs as members (many temporarily only) of WICEN. I was one of these operators and I have to say - I had a ball. For me it was an entirely new experience and an opportunity to see some really beautiful cars at close hand.

Photo 1 The classic 300 SLS Mercedes Benz escaped the museum for a weekend out. (These were also known as the "gull wing" series, I wonder why?)

THE RALLY IS RUN over four days through the beautiful Adelaide Hills on some winding and very hilly roads, starting and ending each day at the Hilton Hotel in the heart of the city. It is from the Hilton that rally headquarters is operated. As communications operators we had to pass all the messages necessary between headquarters and the rally organisers, wherever they were. The safety and the efficient running of the rally depended on us.

There are two parts to each day's rallying. There are a number of special stages comprising closed roads sections where the rally cars were permitted to drive much faster than usual and a number of open sections joining these closed roads where the drivers must obey all the normal road rules. They can and have been booked for speeding just like anyone else.

To facilitate the radio traffic a number of dedicated repeaters and translators were sited on the top of particular hills. The translators accepted signal on 2 metres and transmitted them on 70cm. For a few locations the normal amateur repeaters were used, but in general very little disruption was caused to normal radio traffic. The chart of radio channels to be used for one of the four days is included as an example of the activities.

There were 33 special stages in the 1998 rally. To control and record the car movements as many as 10 marshals were used. They officially closed the roads by tying yellow tape across all side roads and farm gateways and they manned timing and recording tables at the start and finish of the stage. There were four or five police cars and/or motorcycles at each stage and there was an ambulance and an emergency fire unit (identifies as the FIV or first intervention vehicle) on duty at the start of each stage. Emergency vehicles can only enter a stage to deal with an emergency after the stage has been officially stopped, and they can only enter it from the start direction so there is no chance of vehicles meeting head on.

Also at each stage there were at least five amateur operators. There were two at each of the start and finish each with their own radio equipment on the required frequency. This year there was also a radio car with just about all possible frequencies available especially equipped to follow the FIV into the stage in the event of an accident to relay messages direct from the scene. These were the cars we hoped would never be needed.

An international car rally uses a large number of people just to make it run efficiently. Overseas visitors had nothing but praise for the way the Classic Adelaide was run.

As a radio operator, when you reached your particular stage you signed in then set yourself up at either the start or finish and established communications with headquarters. If there are problems you may need to move several times or change frequencies etc till a satisfactory path is found. Then you wait for the road to be closed and the cars to arrive.

For 1998 my OM, Geoff VK5TY and I were at the start of Stage 2, on Sedan Hill, on the edge of the famous Barossa Valley. In 1997 we were at the finish of the same stage. This is one of the more difficult places for communication back to the city. In 1997 a satisfactory channel was only achieved after a third amateur drove his 4x4 up to the top of the hill from which to act as a relay. In 1998 we started off with a clear path but by the time the rally reached us we had problems.

During 1998 WICEN had made some special checks to check whether the upgrade in power to VK5RBV, the Barossa repeater, would solve the problem. When we set up at about 10.30 we could talk to the Hilton through RBV but unfortunately, by the time of the first car's had started the channel had disappeared because the propagation had changed!! In the event all traffic from the start and the finish of the Sedan Hill stage was relayed through a third vehicle located about a kilometre beyond the finish line, at the highest point on the hill. There must be a lot of metal in the minerals of Sedan Hill to make it such an efficient radio shield !!.

We were at Macclesfield at the finish of stage 13 in 1997 and again at the finish of stage 12 near Yankallilla in 1998. These towns are both on the Southern side of the Adelaide Hills and each had its particular communication problem though. From Macclesfield we simply could not use the translator we should have used so we had to change to VK5RSV repeater.

At all times local amateurs, not themselves involved in providing communications for the rally, were most cooperative about the rally use of the

repeaters for which we and WICEN were very grateful. Not one complaint was heard.

At Yankallila the operators at both ends of the stage were experiencing some intermittent interference until one of the roving WICEN people went up to the site of the translator and turned the squelch up to the maximum. The interference was caused by intermodulation frequencies from the local pager systems appearing on the translator frequency.

Personally I found operating through a translator (in and out on the same frequency) very strange because while we could hear messages for other stations being sent from the headquarters we could not hear the signals from those stations. We are all so used to using repeaters where we hear both the input and output signals it seemed odd to hear only one part of the conversation.

The safety procedures of rallying are very strict. Before any competitive car enters a closed stage several official cars will have checked the safety of the stage. Before each of these official cars leaves the start its crew must hold a sheet of paper of the right colour as permission to go. When it arrives at the finish this sheet of paper is given to to the marshal. The marshal passes the paper to the radio vehicle. We send a message to the rally headquarters eg., "Stage 2 is condition Blue" or "Stage 2 is Condition Green" etc.

When the road is legally closed the road is said to be Condition yellow. When the cars were about to enter the stage it is Condition Blue. While they are in the stage and competing, the stage is Green. In the event of an incident the radio operator would be the one to tell headquarters about it so they could declare the stage RED. This can only be done this way because it is an official situation. The marshals on the spot report through our radio channel whenever there is an incident during the rally but all decisions are taken by those at headquarters.

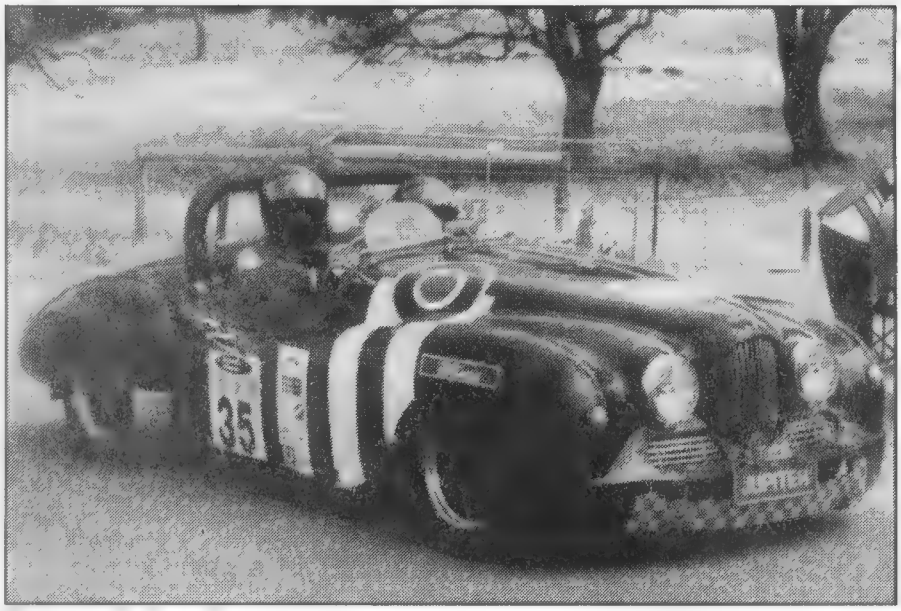


Photo 3 A rare and beautiful Jowet Jupiter in WWII Spitfire colour scheme!

Our task was primarily to pass on any messages given to us by the marshals and to pass to the marshals any messages sent out from the Hilton. As communicators the only messages we initiated were to establish a path and to send lists of the numbers of the cars (in groups of five) to headquarters, as they passed either the start or the finish of the stage. In the headquarters room they made sure everyone was accounted for before the stage was opened to normal traffic.

In the event of a mechanical breakdown or accident the driver or navigator of the car is required to signal to the next car to come past them either that they are alright or that they need assistance. This car then passes this information to the marshal at the finish of the stage. We pass it to headquarters and they decide what, if any action will be taken. On stage 12 in 1998 I had to pass a message that there was oil on the road 900 metres before the finish of the stage. Headquarters passed this information back to the start of the stage so the marshals could warn succeeding drivers about the oil. This chain of messages is standard procedure for rallies around the world. It means that everyone involved does it the same way and knows how it is done.

Rallies like the Classic Adelaide are divided into three sections. There is a group of Touring cars which follow the same route as the rally cars but simply follow one behind the other without competing. There are the Parade cars which lead the racing sections and are timed over them but are not competing for awards. These include the rare and irreplaceable or the incredibly expensive cars such as the Mercedes Benz 300SL, the Jaguar XKSS and the 'C' type Jaguar. Then there are the actual rally cars that are timed to the second over the closed stages. They are competing for a number of awards including the overall fastest time. All the cars drive, untimed, on the open roads (where they must obey all the normal traffic rules) to the next closed stage.

For the closed sections the cars are sent off from the start at one-minute intervals. They may travel as fast as the conditions will allow and they are not restricted to only the left side of the road. They may use the whole road if that will save them a fraction of a second on a corner. Particular places

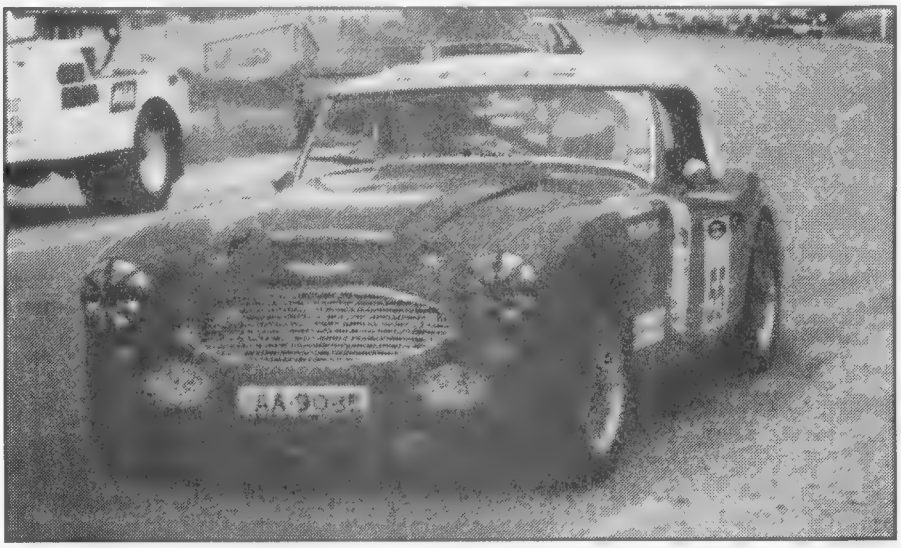


Photo 2 Another Classic - the Austin Healey sports car.

Continued on page 14

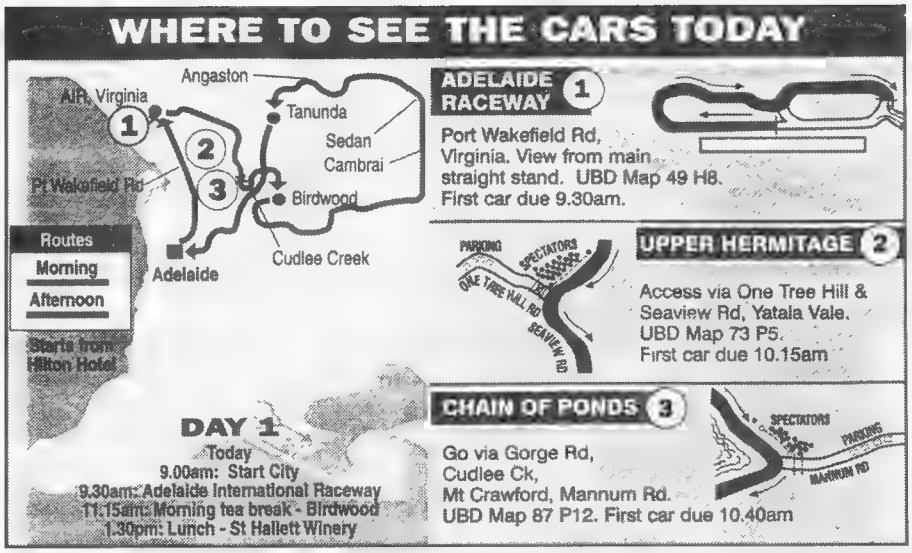


Fig 1 The planned route for Day 1.

Continued from page 13

are set up and designated as safe viewing spots for spectators but local people also sit out behind the farm fences to enjoy the sight of these special cars whizzing by.

With prime positions at the start or finish of the closed stages the amateurs had an excellent opportunity to see cars that are unique. In 1998 Mercedes brought out to Adelaide a 300 SLS model. For the first Classic Adelaide it was the Gull-winged Mercedes, the only one of this type still running. It normally lives in the Mercedes Museum. In the 1998 rally we saw two C Type Jaguars and an XKSS model, the previous year it was a Le Mans winning D type. This has a special fairing behind the drivers' head to improve the streamlining. There were Porsches, Ferraris, a Hispano-Suiza Alfonso, Bentleys, a Lotus, a couple of Alfa Romeos and so many other very special cars, each one lovingly prepared for this event. Many of the amateurs took the opportunity to take photographs that they will treasure for years to come.

WICEN (SA) should be congratulated for the professional way they prepared us for our task. We were all asked to attend a briefing at which everything was explained very clearly. We were given practice in message handling and the use of WICEN message forms (many of us were not at all experienced in the correct procedure as we were only temporary members of WICEN)

We were each presented with a very professionally produced booklet that showed ALL the special stages and ALL the frequency plans, not only the ones concerned with our stages. These booklets were the envy of some of the rally officials as they often had no idea what was happening in the rest of the rally.

For the whole four days of the rally they had roving operators able to cover all contingencies. In 1997 one of the cars moving translators from hilltop to hilltop suffered major problems but someone else was available and able to recover the translator and get it to its position in time. In the case of the pager interference, there was someone free to fix the problem. The same efficiency was reported by all operators.

In 1997 WICEN (SA) had to borrow some translators from WICEN(Vic) but by 1998 they had developed enough of their own translators or found alternative paths for our transmission that they did not need to borrow. I know from personal experience that for several weeks before the rally, cars were on the road testing communication paths. I cannot speak too highly of the work done by the small group of dedicated WICEN members.

The world of rallying is foreign to me normally, though I read about it and see it on television. To be part of the Classic Adelaide with something to do that contributed to it and to be able to use my amateur radio skills as part of WICEN was something not to be missed. I hope I can play a part again next year and for as long as the event continues to be run. I enjoyed every moment of it!!

I sincerely suggest that you offer your assistance to WICEN whenever you get the opportunity. You will gain both personally and in your technical skills.

ar

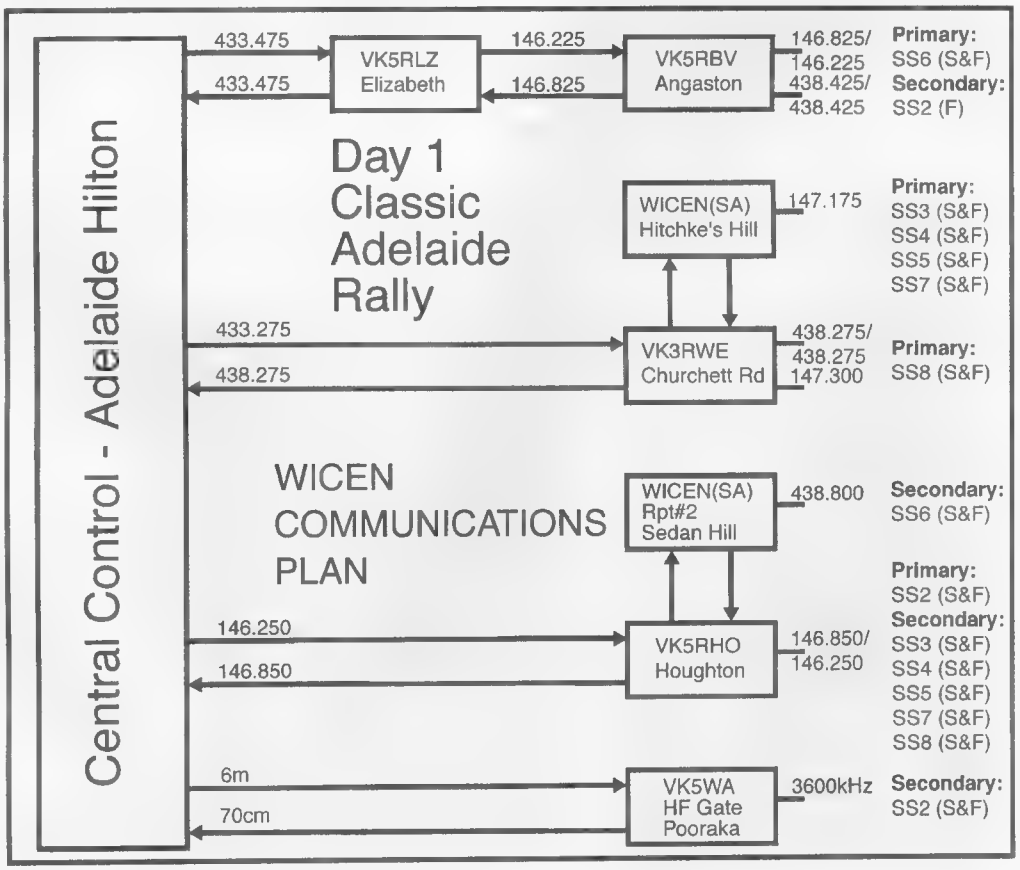


Fig 2 The radio plan for the our communications.

All Is Not Old That Glitters

(A Capacity to Deceive)

By Mike Krochmal, VK3KRO
PO Box 112 Ormond Vic 3204

WHILE RECENTLY RESTORING a "venerable boat-anchor", I found a rather large and ugly hole in its chassis where there once had stood a mighty electrolytic (50 + 50 µF / 350 V, screw-base) in its aluminium can. In its place, elsewhere on the chassis, were a couple of huge, ugly blue pigtail electrolytics of doubtful but modern provenance, mounted in turn on a large chunk of phenolic board bolted into the side of the chassis. They looked about as appropriate as a pair of gumboots on a ballerina. Also, for all their size, they were a bit on the wimpy side, being only 24 µF (albeit having a 500 V rating).

I have no objections to the discreet replacement of some of the more horrible components in these old rigs (such as 20% resistors, way out of even that wide tolerance range, and paper capacitors long past their "use-by" date) with modern-day equivalent components. However, I do take umbrage at the rather crass, yet commonly employed, solution that had been applied by the previous owner of this rig. Multiple electrolytics of the type originally used here are now a bit difficult to obtain. Even if one is lucky enough to find one, its current condition and expected remaining service life are matters of some concern. Thus it became my intention to apply a "stealth" solution to the current quandary, by manufacturing my own electrolytic with the looks of the old and the performance of the new (a sort of wolf in sheep's clothing).

By a stroke of luck, and through the kind offices of my good friend Brian, VK3WYN, I was able to obtain the empty case of a similarly-sized electrolytic which had long since passed on to that big be-Jouled place in the sky where all old capacitors eventually go. It had already been carefully disem-bowelled by a previous operator (would you call that a Faradectomy ?). It consisted merely of a topless carcass with a retainer nut underneath. It also had a fairly prominent dent in one side. (A good friend, by the way, is someone willing to part with the last electrolytic capacitor in his/her junkbox).

Photo 1 The raw materials: - an old electrolytic casing, film canister cap, two new electrolytics, heatshrink tubing, and a 150 mm ruler for size comparison.

The first step was to roll out the dent, which was achieved by judicious application of the end of a ball-peen hammer. Fortunately, the dent was right near the top end, where the hammer was able to reach. The next step was to remove the accumulated grime of several generations from the outside of the capacitor case. Here I got a bit gung-ho : I used a Scotch-Brite [TM] plastic scouring pad. That sure got rid of some nasty-looking spots on the case, but produced a shine which was bright enough to allow me to check out the acne on my cheeks - a bit out of place in a piece of time-worn vintage equipment. Fortunately, it was at about this time that I remembered a great tip about how to finish aluminium panels, which I had once read in an old ARRL "Radio Amateur's Handbook" (5th Edition, 1929). I quote from Page 63 : "The panel can be given a pleasing finish by stripping it in a strong solution of washing soda. When removed from the solution the 'aluminum' will have a clean matt surface which can be preserved, after the panel has been well washed in clean water, by giving it a thin coat of Duco lacquer". No problem here, apart from the fact that those guys never did learn how to spell aluminium and the fact that presumably any good-quality clear lacquer would do in place of Duco lacquer. Washing soda is sold in supermarkets as Electric Soda. (Washing soda, for those of you who, like me, fell asleep in chemistry classes, is sodium carbonate. It also goes by the name of Natron, that magical substance used by Egyptian embalmers of old to preserve the mummies). Don't confuse washing soda with caustic soda or soda bicarbonate. Either of these should work just as well, but caustic soda is a bit more dangerous to handle and dispose of.

I duly trotted off to the laundry and, while the XYL was out, made up a good strong solution of washing soda in water, in an old plastic tub. (Don't try this in one of those stylish new ceramic kitchen sinks, if that's what you've got - might lead to major marital unpleasantness). I went outside to do the pickling (of the capacitor can, not me - there wasn't a bottle in sight !), making sure I avoided breathing in any nasty vapours, splashing it on my best clothing, or leaving it around for the neighbour's cat to imbibe. The lye bath dressed up the outside of the electrolytic beautifully. (Actually, mother always told me to have nothing to do with nasty lyes, or my nose would grow. I didn't, but it did, anyway .)

Back to the electrolytic. The next step was to give the outside a coat of clear lacquer, to avoid unsightly fingerprints further down the track. Now the fun part - compared to the two original capacitors in the can, providing 2 x 50 µF at 350 V rating, which would have occupied the entire volume of the 3.4 cm diameter, 10.5 cm high can (a volume on the order of 95 cc), the two separate slightly more modern 24 µF / 500

Continued on page 16

AV-COMM
Pty.Ltd

SATELLITE TV EQUIPMENT
-: Established 1981 :-

Specialising in:
Free to Air Satellite TV

CALL OR FAX
FOR FREE INFO PACK.

198 Condamine Street
Balgowlah 2093 Australia

Tel: 61 2 9949 7417
61 2 9948 2667
Fax: 61 2 9949 7095
Internet: http://www.avcomm.com.au

AMATEUR TRANSCEIVER RADIO CENTRE

ALINCO NO 1 FACTORY DIRECT IMPORTER AUTHORISED DEALER
MASSIVE MONTHLY STOCKIST
LATEST ARRIVALS
NEW DJ-V5E 6w VHF/UHF
DR-M06T 6m, DR-610E, DJ-G5EY,
ANTENNA TUNERS, POWER SUPPLIES,
BIGGEST DISCOUNTS ON BULK
PURCHASES OF ALINCO AMATEUR
RADIOS & ACCESSORIES.
FULL 3-YEAR FACTORY BACKED
WARRANTY
ALINCO SPECIALIST

ICOM IC-706MKIIG, IC-T81A, IC-2800H, IC-746, IC-756-Pro, IC-T8A, IC-R75, IC-Q7A.

KENWOOD TS-570SG TM-V7A TH-G71A VC-H1 TH-D7A TM-G707A

JRC NRD-545G, JST-245, NRD-345.

KANTRONICS -
KPC-9612, KPC-3, KAM-98, KAM PLUS

PHONE (02) 9896 2545
E-mail: atrc@bytelink.com.au
Web Page:
http://users.bytelink.com.au/atrc

Continued from page 15

V capacitors, which I was about to give the heave-ho, were roughly 2.5 cm in diameter with a length of about 5 cm (thus having a total volume of about 50 cc). The two capacitors I was about to squeeze into the can were each rated at 47 µF at 350 V, and measured a mere 1.6 cm in diameter, with a 3.3 cm length and thus a total volume of about 13 cc! It is instructive to consider what this all means in terms of how the march of technology is reflected in the two parameters of charge density and energy density :

Total Capacitance (uF)	Voltage rating (V)	Volume (cc)	Charge stored Q = C x V (Coulombs)	Energy stored $W = {}^1/_2 C \times V^2$ (Joule)	Charge density=Q /Volume	Energy density = W/Volume
Old : 100	350	95	35,000	6,125,000	368	64,474
48	500	50	24,000	6,000,000	480	120,000
New : 94	350	13	32,900	5,757,500	2,531	442,885

Table 1 : Old vs. new capacitor technology

Just goes to show how far we've come since the bad old days, mainly through improvements in dielectric materials.

But I digress. To give the two capacitors a semblance of mechanical stability, I decided to enclose them in heatshrink tubing. I then wired them up with three long trailing wires (common ground lead, two active leads), encased them in another layer of heatshrink tubing and some electrical insulating tape for good measure, and then placed the whole assembly in the can, with the connecting wires coming out of the bottom. The cap of a 35 mm film canister made a perfect top cap, and before fitting this I filled the entire can with neutral cure (very important point !) silicone roofing glue.

I had considered also enclosing a little note in this "time capsule", along the lines of "Fooled You !", in the event that a future adventurer might be silly enough to explore the inside of the can, but in the end discretion prevailed, as I thought that this unkind sentiment might result in the untimely demise of one of my descendants, being the consequence of an act of vengeance by the explorer. The intended function of the silicone glue, by the way, was partly for added electrical insulation, partly to stop things rattling around inside the can, and of course as a fun element for the future adventurer.

Next, I used a word processor to type up an appropriate label to indicate the capacitance value and voltage rating and (cheating only slightly), the now defunct manufacturer of the boat-anchor. I transferred this label on to an overhead transparency film on a photocopier, then reversed the transparency and re-copied it. This gave me a transparency with the lettering protected on the inside. I happened to have a dead valve with a transfer of the company's logo on it, which I floated off in water and transferred this on to the can to complete the deception. The CIA would have been proud of me. Finally, I wrapped the overhead transparency film around the can (over the logo transfer) and used a fine strip of sticky-tape to hold the transparency on to the can. Voila !

So there it is. Skullduggery in one easy lesson. The purist reader will no doubt cringe and take me to task, in a future "Over To You" column, on why I did not reconstruct the capacitor from first principles, using foil and boracic/boric acid. My reply is contained in my email signature : "Life's Too Short !". I hope that the above is useful to the less purist portion of the radio amateur and shortwave listener community.

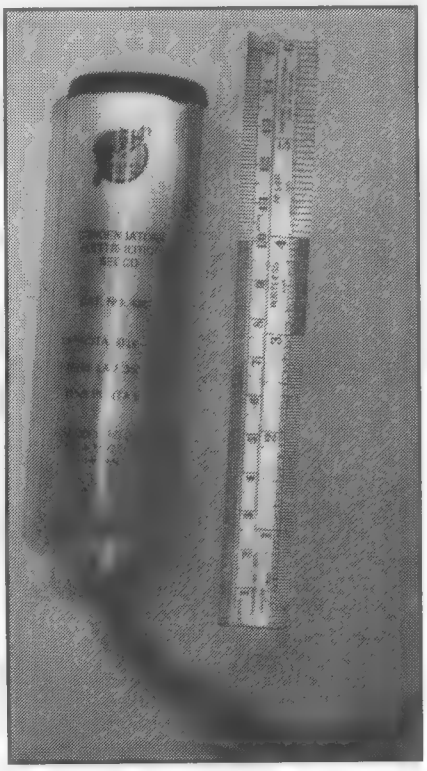


Photo 2 The finished product just prior to mounting on the boat-anchor chassis.

An L&T-Match Design Chart

Graham Thornton VK3IY
17 Britannia Creek Rd,
Wesburn Victoria 3799
graham@scservnet.com

Direct calculation of component values for an L-Match with series reactance input is a tedious process, involving awkward series to parallel conversions, and equally awkward parallel reactance combinations. The chart presented here eliminates these difficulties by working directly with series impedances.

A school compass is all that is necessary to derive the component values. Further, the chart provides information from which insertion loss and capacitor voltage can be found graphically.

The chart did not arise by any designed intention; it came about by pure serendipity. While searching for the reason for 'holes' in the Z-Match response (Ref 1), a plot was made for a given shunt inductance to see what load impedance combinations could be made to look like a 50 ohm resistance in series with a reactance.

Very much to this author's surprise, the result turned out to be a perfect circle when plotted on the load resistance/ reactance plane.

Don't be discouraged by the apparent complexity of the chart. It may bear a superficial similarity to a Smith chart, but such a resemblance is illusory. This chart uses rectangular co-ordinates. It should be regarded as a pragmatic tool that provides the answers we want very simply. If we attempted to use a Smith chart for this application, the loci of interest would be elliptical and of little practical value.

The Series Reactance L-Match

A brief recap may be appropriate on the action of this matching circuit. The shunt element converts the impedance of the load into a required value of resistance (eg 50 ohms) and some value of reactance. The reactance of this converted impedance is then resonated by the addition of a series reactance of equal value but opposite sign. The series element and the combined impedance of the load and the shunt reactance form a tuned circuit with a total impedance of 50 ohms resistive. (Or such resistive load as is required.)

The Chart

The chart is presented in two ranges (Figures 1 & 2) in order to cover the expected values. The two axis of the charts are the Series Load Resistance (Horizontal), and the Series Load Reactance (Vertical).

The circles represent the reactance of the series element in the network. All points on the circumference of one of these circles have a constant value of equivalent parallel

Continued on page 19

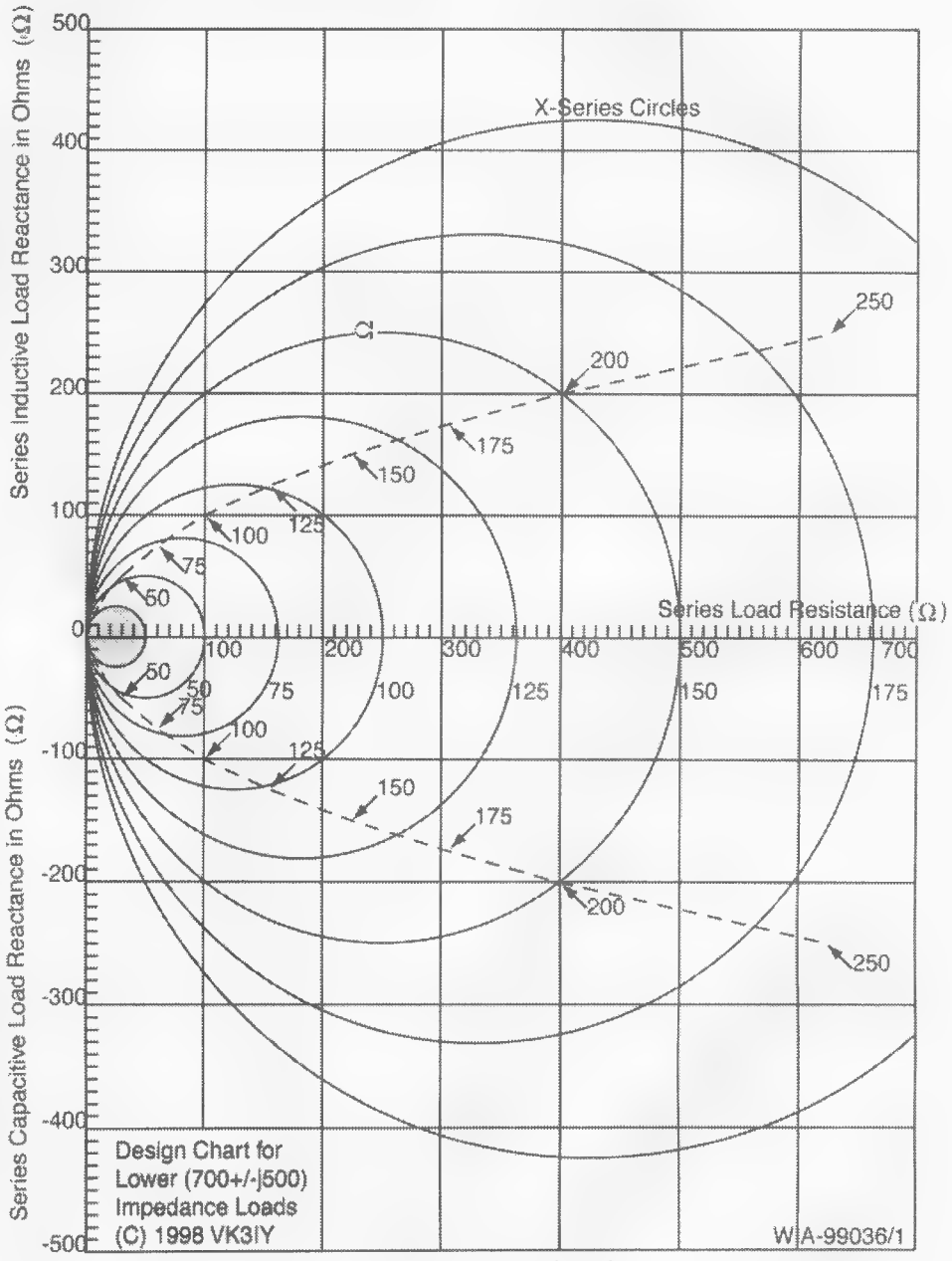


Fig 1. Design Chart for Lower Impedance Loads

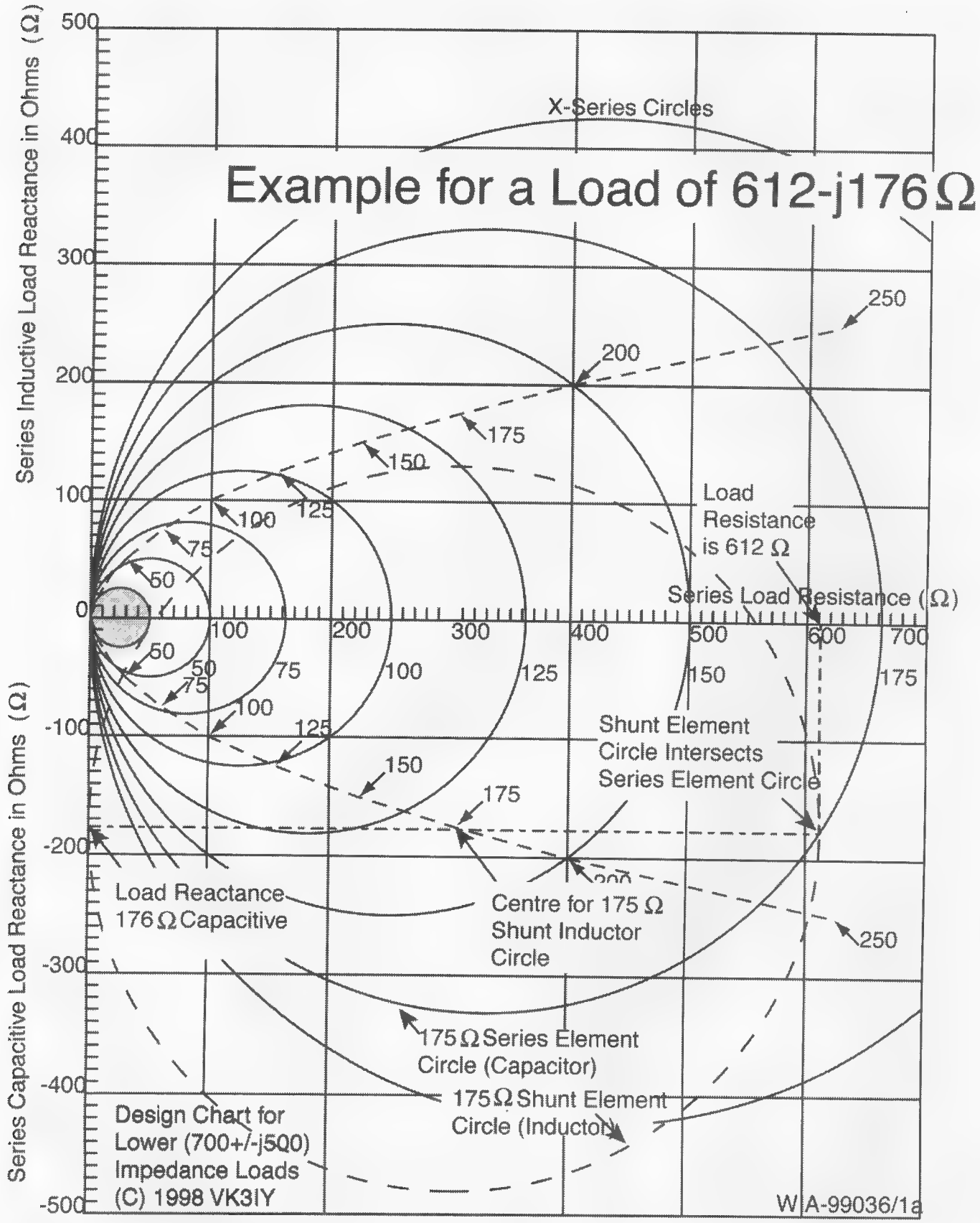


Fig 1a. Example of chart used to match a 612-j176 ohm Load to 50 ohms

Continued from page 17

load resistance, the value of which is found at the intersection with the resistance axis. The parallel resistance can also be calculated as $(X^2_{Series}/50) + 50$ ohms.

The smallest circle in Fig 1 is shown shaded as it represents the limiting case where the series element is a short circuit, and the equivalent parallel resistance is 50 ohms. Any point on or inside this circle cannot be dealt with by a series input reactance L-Match. To solve this problem, add a small reactance of either sign in series with the output (ie creating a T-Match). As can be seen from the chart, the simple L-Match can cope with a wide range of load impedances.

Note that the centre of each circle is on the resistance axis and is tangental to the reactance axis.

The shunt element has a unique circle also, whose radius depends on its reactance. However, the centres of such circles are located off the resistance axis along the dashed line.

Thus each series circle can intersect with a shunt circle, and the point of intersection represents the load impedance read from the horizontal and vertical axis, for which the combination will result in 50 ohms.

To avoid cluttering the chart, only the centres of the shunt circles are shown.

Using the Chart

Let us first look at a set of values that are already chosen. Figure 1a is a copy of figure 1 except that a dashed circle is shown for a shunt inductance of 175 ohms. The intersection of the 175 ohm shunt reactance circle and the 175 ohm series reactance circle will resonate to 50 ohms, a load with a resistance of 612 ohms and a reactance of 176 ohms capacitive (612-j176). Note that there is second intersection for a load of about 10-j80.

Intersections with series circles give the conjugates of this variable reactance, and thus a pure resistance of 50 ohms. (The shunt element alone provides resistance transformation; the series element merely gives resonance.)

A similar result would apply for any other shunt circles that might be drawn. These circles are always tangent to the reactance axis. Note that shunt inductors always have their centres below the resistance axis and capacitive shunts always have their centres above the resistance axis. (Either system may confer some advantage in component values, efficiency or bandwidth.)

Note: Some may experience difficulty interpolating between series element circles. To help with this, a graph is provided so that any circle drawn experimentally may have its series reactance read directly. See Figure 4.

For a known load impedance

Plot the load impedance point on the chart.

If the load point lies on one of the series circles given, then record that as the series element reactance. If not, we need to draw an arc for ourselves. Make a light line from the load point to the origin. Midway along this line, draw a light line at right angles to cross the series load resistance line. Where it does is the centre for the series circle. Draw an arc cutting the resistance axis. This will give you the parallel equivalent resistance of the load. Reference to Figure 4 will give the value of series reactance required.

Find the shunt reactance value. You need to find a point along the dashed shunt centres line where you can place the point of the compass to just reach the load reactance line and just pass through the load point. Trial and error seems to be the easiest method here. We need to know the final position of the compass point on this line. The load reactance scale may be used directly for interpolation, though the sign must be reversed.

For known element reactance

Place the compass point along the shunt centres line for the value of the shunt reactance, interpolating as necessary.

Adjust the radius of the compass so that the pencil point just reaches the load reactance axis.

Draw an arc that passes through the known series reactance circle. The point where the compass intersects the series element circle gives the load impedance that will look like a pure 50 ohm resistance at the network input. (There is no point in drawing the entire circle.)

If the series reactance circle is not already on the chart, use Figure 4 to find the equivalent parallel resistance of the load. The value obtained is twice the radius of the series circle, so use half that value as the centre and radius.

The T-Match

The T-Match contains an extra element in series with the load. This is very easily accommodated. Add the inserted reactance to that of the load (algebraically). ie move the load point vertically on the chart.

The L-Match has a unique pair of elements for each load impedance combination. If the output reactor is variable, we have an infinite variety of component combinations which will give a 1:1 SWR at the transmitter when using a T-Match. Which of these settings is best?

There is one invariable rule: the setting with the least input reactance will be the most efficient. (You can understand this from the chart. The smaller the series reactance, the lower the equivalent parallel resistance, and thus the higher the efficiency.) Similarly, the efficiency will be greatest when the load reactance is smallest.

So, for efficiency, you should always move towards the resistance axis on the chart. ie the sign of the inserted reactance should be opposite to that of the load. (If the input reactance passes through a minimum as we adjust output reactance, then the minimum represents complete load reactance compensation - ideal for efficiency.) Happily, the condition of maximum efficiency also represents the minimum voltage across the network capacitor, and the widest bandwidth.

Efficiency & Insertion Loss

The efficiency is different under the two options of shunt or series inductor. At first sight, this may appear puzzling. However, it becomes clear if we bear in mind that the current through the inductor is different in each case. The treatment given here assumes that all the loss is due to the resistance inherent in the inductor; ie the capacitor is loss free.

The series inductor is the simpler case, so let's take that first. Part of the total 50 ohms series resistance is due to the coil. Figure 5 shows insertion loss for three different values of coil Q, depending on the reactance of the coil obtained from the chart.

In the shunt inductor case, efficiency is dependent on the ratio of R_p to coil reactance; it is necessary to work out this ratio for yourself. Figure 6 will then give the insertion loss for three different values of coil Q.

For a given installation, it is probably worth looking at both options, in case there is some advantage of one system over the other. Given practical values for antenna impedances, and achievable coil Qs, it is difficult to get an insertion loss greater than 1 dB. However, if running a kilowatt, this represents a loss of 200 W, which would be a problem to avoid excessive temperature rise.

Table 1 shows the heat produced as a percentage of power applied to the network, for given values of insertion loss.

Continued on page 21

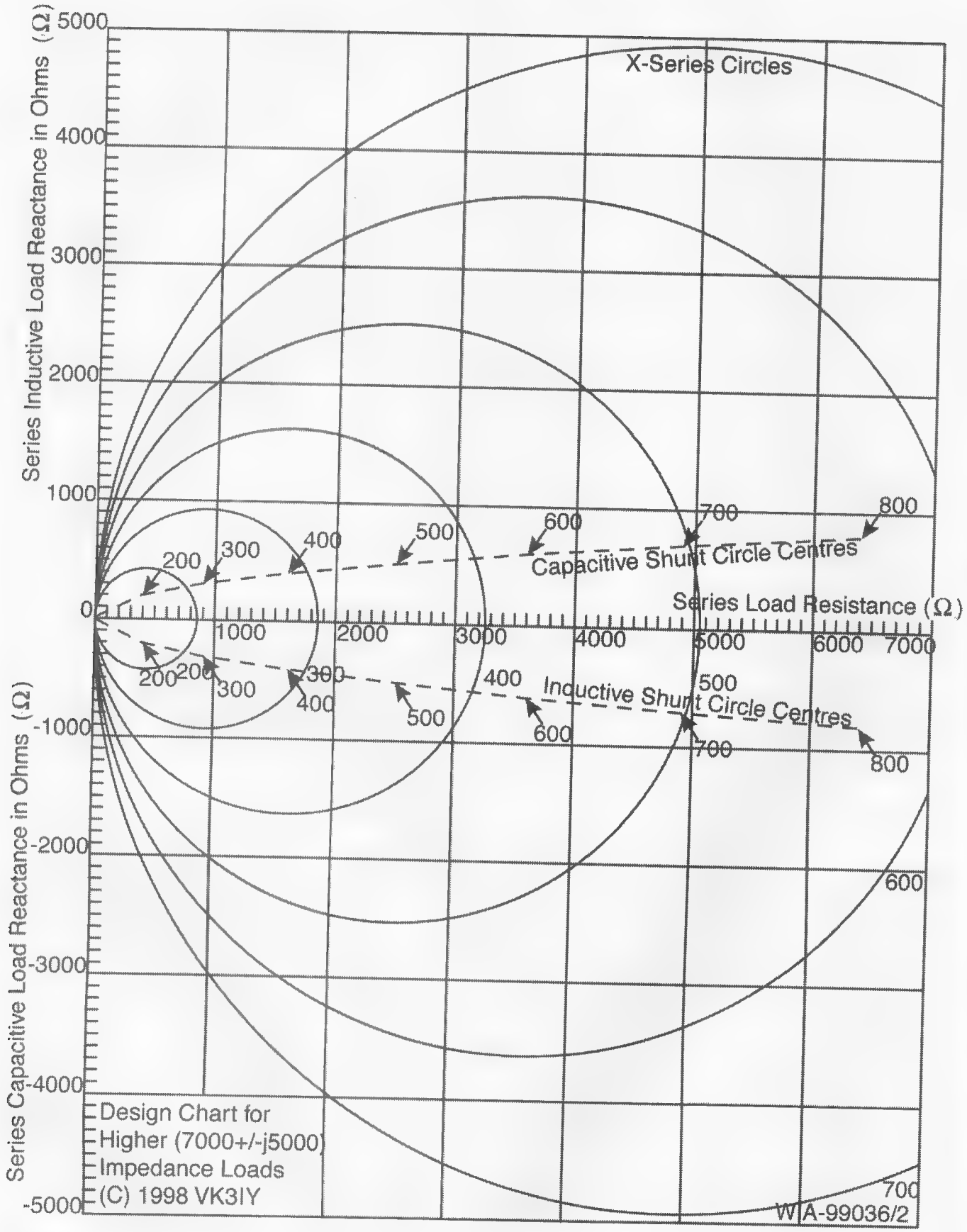


Fig 2. Design Chart for Higher Impedance Loads

Insertion Loss (- dB)	Power Loss (%)	Insertion Loss (- dB)	Power Loss (%)
.05	1	.8	17
.1	2	.85	18
.15	3	.9	19
.2	4	.95	20
.25	6	1.0	21
.3	7	1.05	21.5
.35	8	1.1	22
.4	9	1.15	23
.45	10	1.2	24
.5	11	1.25	25
.55	12	1.3	26
.6	13	1.35	27
.65	14	1.4	28
.7	15	1.45	28
.75	16	1.5	29

Table 1. Percentage of power lost as heat for a given insertion loss.

Continued from page 19

Capacitor Voltage

The value of peak voltage across the capacitor may be obtained from Figure 7, having read off the value of equivalent parallel resistance from the chart. Above about 300 ohms, the voltage is the same regardless of the position of the capacitor in the network.

Balanced Loads

The L (or T-Match) is essentially an unbalanced system. One side of the generator (the rig) is earthed. Perhaps the simplest and most effective way out of this problem, is to use a one to one toroidal balun between the rig and the ATU, floating everything else above earth. This will be fine if the current distribution of the antenna system is fixed by its own geometry. (eg dipole open ends.) However, with any sort of closed loop antenna, the imbalance in the ATU will upset the works and give unbalanced feeder currents.

With series capacitor input and still using an input balun, the capacitive reactance can be split into two halves, one in each leg. These capacitors can be adjusted for line balance, as well as SWR seen by the rig.

Another solution is to use a T-Match with a 1:4 balun before the compensating reactance. Since baluns do not like reactive loads, the load should be adjusted to be (or be close to) a pure resistance. A shunt compensating reactance is more appropriate here.

Continued on page 22

Mathematical Matters

This section is optional reading only. It is included for completeness, and to assist those who would like to produce their own chart on graph paper. If, as I did, you need a bit of revision about the elementary algebra of a circle, here goes:

The equation for a circle:

$$(x - a)^2 + (y - b)^2 = r^2$$

The empirical equation for the shunt reactance circles is given by:

$$\left(R_s - \frac{X_{Shunt}^2}{100}\right)^2 + (X_s + X_{Shunt})^2 = \left(\frac{X_{Shunt}^2}{100}\right)^2$$

The above was obtained by 'inspired guesswork'. Attempts to derive it by analysis have so far proved futile. A random test of some 17 intersections gave component values which were within one or two percent of the calculated ones. The possibility of this result being obtained by chance is remote indeed! If you would like to test your skill in manipulation of algebra, have a go yourself by all means!

The equation for the series reactance circles (by analysis) is:

$$X_s^2 + \left[R_s - \left(\frac{X_{Series}^2}{100} + 25\right)\right]^2 = \left[\frac{X_{Series}^2}{100} + 25\right]^2$$

The relationship between requisite series reactance of the network and equivalent parallel resistance of the load is:

$$X_{Series} = \sqrt{50(R_p - 50)} \quad (\Omega)$$

The efficiency with series inductor is: $$\eta = \frac{50 - \frac{X_{Series}}{Q_u}}{50}$$

The efficiency with shunt inductor is: $$\eta = \frac{1}{\frac{R_p}{Q_u X_{Shunt}} + 1}$$

In both cases: $$Insertion\ loss = 10 \log_{10}\eta \quad (dB)$$

The peak voltage across the L-Network capacitor is:

$$E_{Max} \approx \sqrt{2PR_p} \quad (V)$$

Continued from page 21

Care would be needed that sufficient turns were provided in the transformer to ensure that the primary inductance is swamped by any likely value of reflected resistance.

Equivalent Parallel Load Reactance

This can be obtained from the chart as follows: centre the compass at a suitable point on the reactance axis and draw a semi circle such that it is tangent to the resistance axis and passes through the load impedance point. Where this semi circle cuts the reactance axis is the equivalent parallel load reactance. (If the intersection is off the chart, simply double the radius as found on the reactance axis.) Shunting the exact opposite of this across the load gives reactance compensation.

Conclusion

A simple graphical technique has been described which enables component values and other parameters of an L or T network to be easily obtained. It should be noted that the chart is only appropriate for a 50 ohm system.

Previously published work (Ref 2) gave graphical techniques to achieve the same end. In time, I must confess I found the treatment difficult to follow. I hope this material will make amends for past indiscretions!

The insertion loss curves reveal that the worst case loss for an L-network is of the order of one decibel. From the viewpoint of signal strength, there is little to be gained by improving this with a T-Match. With higher powers, and consequent dissipation problems, a T-Match, properly adjusted, can make a significant difference. The trick would appear to be to try an L-Match first; if the coil does not get unduly hot or the capacitor doesn't arc over, then leave things be. QRPers need not consider a T-Match, except from the viewpoint of bandwidth. The advantage of high Q inductors when using high power is obvious from the loss curves.

The low impedance output L-Match has not been considered here; a simple technique has been given to overcome this deficiency.

The chart may be used in reverse to determine the complex load impedance. If an SWR of one can be found experimentally with an L-Match, and its constants estimated (or, better still, measured) this will provide sufficient information to find load resistance and reactance.

Just why the loci are circular, is a philosophical question that I can only leave you to ponder for yourself.

References

1. The Z-Match and its Matching Load Range - An Inherent Dropout with Certain Capacitive Loads. Lloyd Butler VK5BR & Graham Thornton VK3IY, Amateur Radio March 1997 p 21.
2. An L of a Network Part 2. Graham Thornton VK3IY, Amateur Radio April 1995

BR

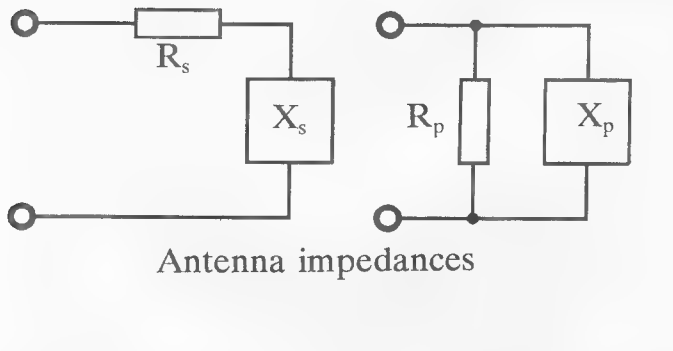


Fig 3. Network Schematics with definition of terms.

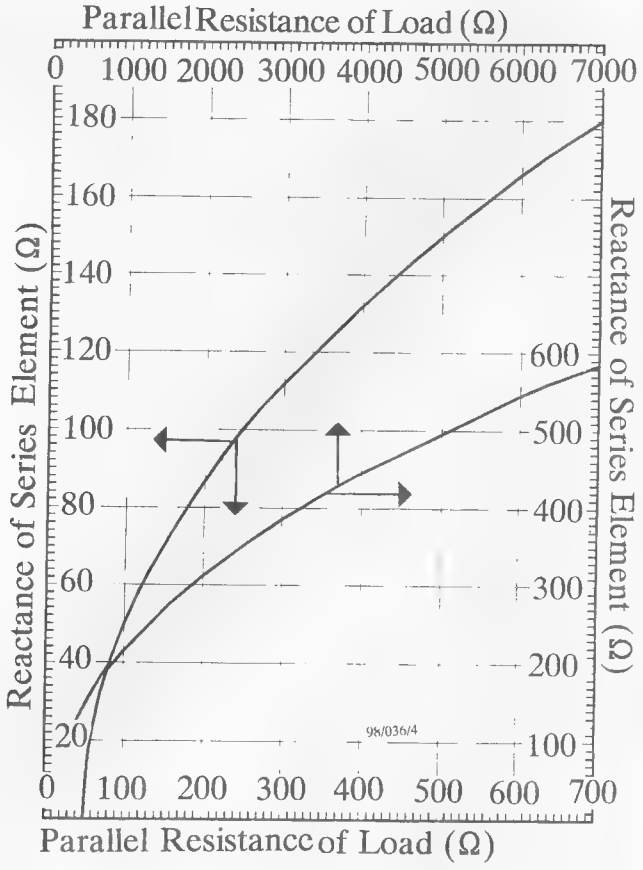


Fig 4. Interpolation curves to give accurate values of X_{series} for given value of R_p

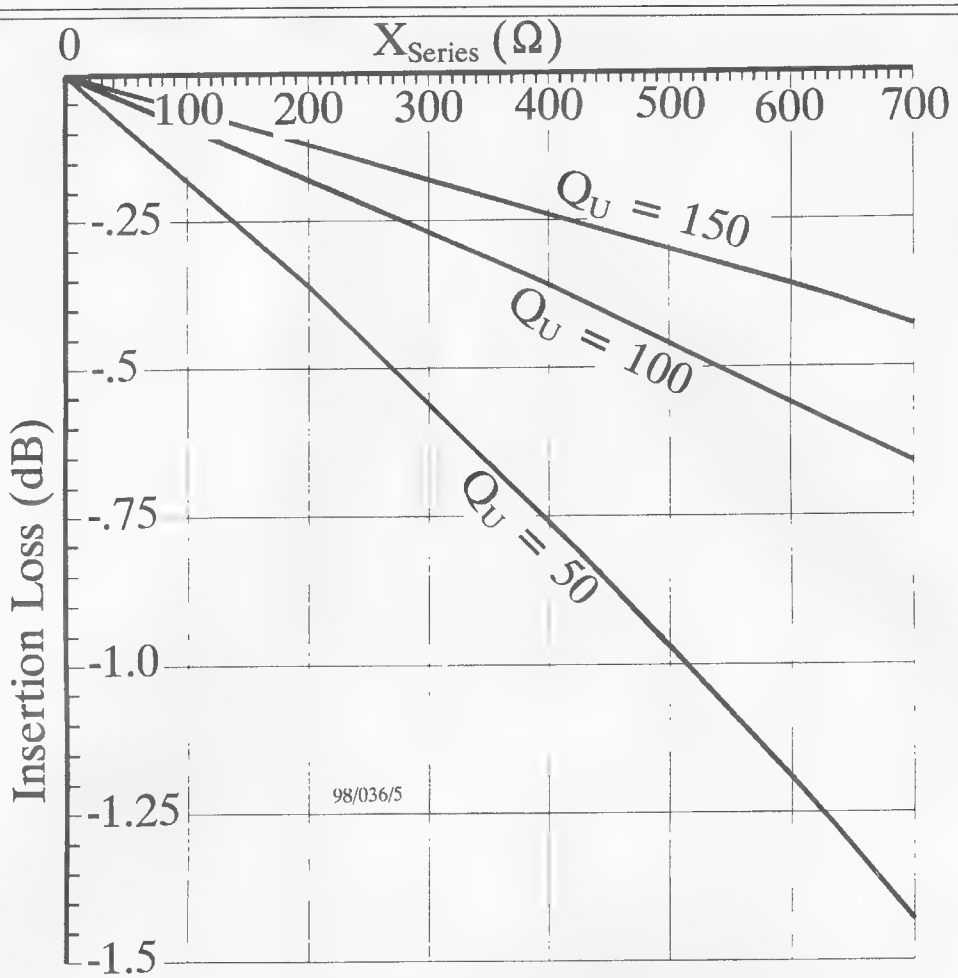


Fig 5. Insertion loss with series inductor

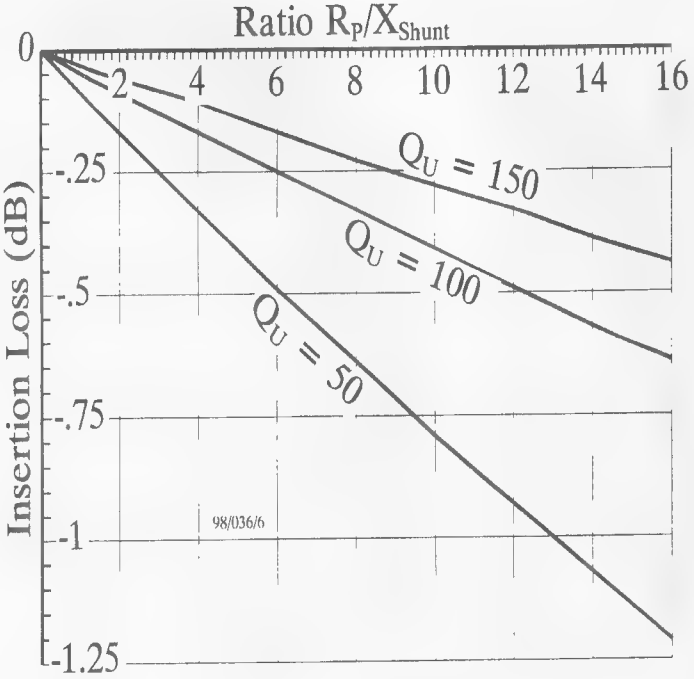


Fig 6. Insertion loss with shunt inductor

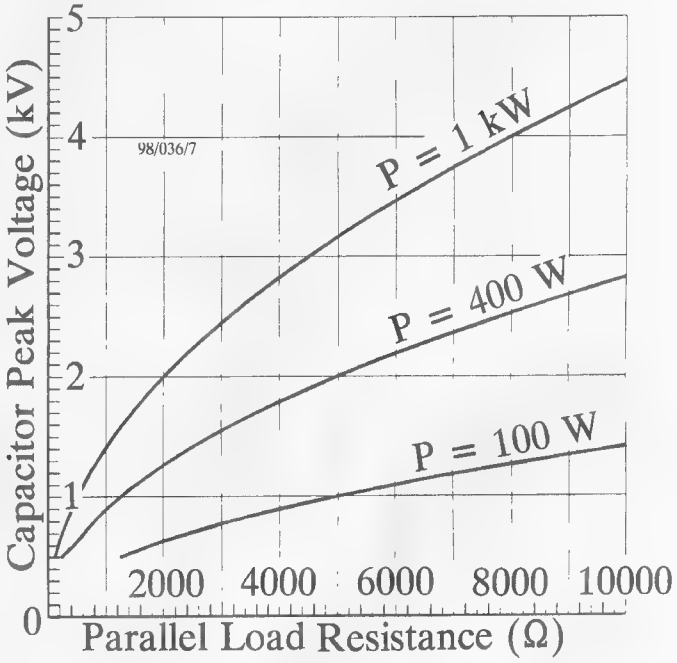


Fig 7. Peak capacitor voltage for a given R_p

An RF Resistance Bridge

Drew Diamond, VK3XU
45 Gatters Rd
Wonga Park, 3115

A desire to have the best antenna that our circumstances will permit seems always to be with us. The amateur without at least a few items of test equipment, who must rely on educated guesswork and signal reports to find out how a new antenna is working (or not working)- may be enjoying the job, but is nevertheless rather handicapped.

THE MOST POPULAR all-round tool for antenna work is the SWR meter, or bridge. With it, we can see if an antenna and feedline is an acceptable match to the transmitter's output amplifier. In a coax fed system, a reading of perhaps 1.5 or 2.0 at the station end would make most of us seek out the problem. Such a reading could be caused by one, or a combination of several things. But an SWR meter can only tell us that there is a significant mismatch-somewhere between the meter, and space. Furthermore, the device may require anything from 1 W to 50 W to obtain a meaningful reading.

That's where the noise-bridge is so handy. Quite accurate RF impedance measurements may be taken at various points in a system with little or no radiation occurring. The noise bridge is an amateur invention, a successful "lateral thinking" approach, where a broadband noise is applied as signal, and the station receiver is used as tuneable detector in a bridge measurement (rather than the traditional laboratory method, which employs a modulated signal generator and straight detector).

Much has been written about the noise-bridge in amateur publications, but nearly all of them continue to use a noise generator as signal source, and a receiver as detector. But now the cost of modulated signal generators has fallen so that one may reasonably be added to our equipment armoury. By using a tone-modulated RF signal from a generator, rather than noise, we eliminate the need for a sensitive receiver as detector. A simple diode and audio amplifier has sufficient sensitivity to detect a 1 mW signal, and allow adjustment for null in RF impedance measurements. Also, the human ear is a wonderful instrument in radio tests. When making adjustments, it is much easier for us to listen for a null in an audio tone than it is for noise (see Ref 3).

Taking this idea as starting point, bridges that measure both resistive (R) and reactive (X) component of an impedance (R+/-jX), and bridges which measure just the R component were constructed and applied to measurement problems. Now, it must be said that an ability to quantify both R and X components of an impedance is very useful. However, it was found (and has been observed elsewhere, see Ref 2) that inclusion of X measurement significantly complicates the construction, calibration and use of the bridge, whereas, in amateur work, a bridge which measures only the R component may be usefully applied to most measurement problems. We amateurs can generally get around the lack of an X arm because of the fact that we are aiming at one goal; we want an antenna that presents a matched resistive load, and by reasonable assumption, works most effectively. And this condition is satisfied when the antenna is resonant and matched to the transmission line, whose impedance (usually 50 ohms) the radio is designed to work into. To us, the value of the X component is generally of academic interest only, because, whatever the outcome, it must be eliminated, or reduced to as low a value as reasonably possible. A variation in the generator's frequency allows us to determine whether the antenna is too long, or too short.

An RF resistance bridge may be used to find, with reasonable accuracy;

- the resistance of an antenna feed-point, at resonance,
- velocity factor of RF cables,
- characteristic impedance of RF cables,
- the value of RF input resistance of amplifiers and other devices,
- settings for antenna couplers whilst putting less than 1 mW to air, and

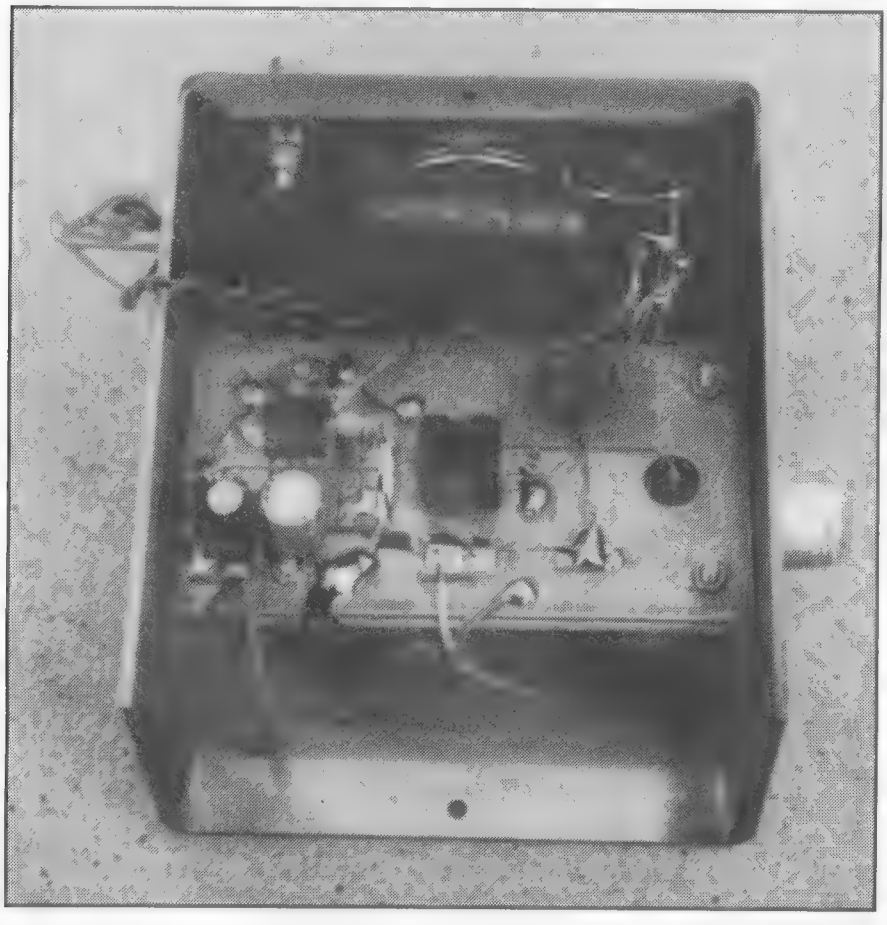


Photo 1 The internal layout.

- the value of microhenry inductors and pF capacitors.

Circuit

The circuit configuration is based upon the popular transformer-ratio-arm bridge, where the three identical windings of T2 are connected in trifilar form as shown in the schematic. Two windings are connected in series to create a tightly-coupled source with a neutral wire formed by the centre tap (ct). The signal voltage available at top and bottom windings are therefore identical in value, and opposite in phase. A diode detector is connected between neutral and chassis ground.

An AM tone-modulated RF signal of about 1 mW power level is applied, via balun T1, to the primary winding of T2. The balun is necessary to preserve capacitive balance between the ends of the secondary winding and ground. The bridge will be "in balance" when the value of the variable resistor is adjusted to exactly equal the resistance applied to the "unknown" connector. Under balanced condition, there will be no signal for detection at the neutral point. However, when either the unknown or dial resistances differ, balance is disturbed, and a signal is created whose amplitude is proportional to the degree of imbalance. The detected audio tone, via a 10 K sensitivity potentiometer, is presented to a conventional LM386 audio amplifier and miniature speaker.

Operationally, if the impedance connected at unknown is in the 0 to 220 ohm range, and predominantly resistive, an audible "null" is produced when the dial resistance is adjusted to match that at Unknown. Should there be some reactance present, the null will be less pronounced. The generator may be varied in frequency together with the R dial to obtain a deeper null. More under "Operation" below.

Construction

The prototype is housed in a Horwood aluminium box type 34/4/D, which measures 100 x 100 x 75 mm. Naturally, a home-made metal box of similar dimensions will do. Except for balun T1, all components are accommodated "ugly" style upon a plain circuit board measuring 50 x 95 mm. Use reasonably short connections, especially the bridge wiring. The LM386 is fitted into a wire-wrap socket, which in turn is mounted "paddyboard" fashion upon the main board. The circuit board is fixed with four 3 mm screws to a right-angle aluminium bracket, and the whole assembly is then mounted onto the box by means of the four coax socket retaining screws. A hole in the board allows connection of the unknown coax inner pin.

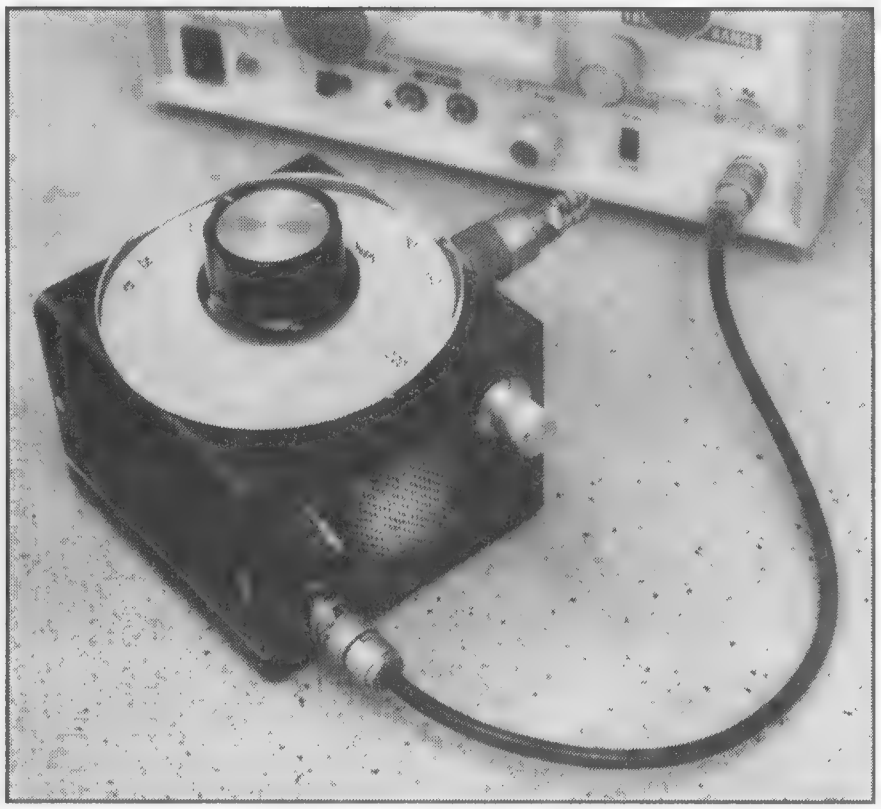


Photo 2 Generator and Bridge set.

Balun T1 is very similar to that described previously in Ref 5. By using 18 B&S enamelled copper (EC) wire, the device is self-supporting, which simplifies construction, and avoids having to use pads or tags at the T2 end (which may cause imbalance). Wind 9 turns (total 27) trifilar onto a 50 mm length of ordinary loopstick rod. Winding starts are the dotted numbers (1. 2. 3.). Note that the start of winding 3 is connected to the end of winding 1, and the end of winding 3 is connected to start winding 2. The balun assembly should then the encased in epoxy cement.

Bridge transformer T2 has 11 loops of 24 B&S EC wire trifilar wound upon an Amidon FT50-43 core. Make sure the wires are not scratched during winding. Remove about 20 mm enamel from each wire. Using your multimeter on ohms, identify the individual windings. Now connect the start of one winding to the end of another to form the centre tap. The remaining "free" winding is the left-hand primary side shown in the circuit. Super-glue T2 onto a small square of phenolic (or similar), which in turn is cemented to the main board as shown in Photo 1.

Continued on page 26

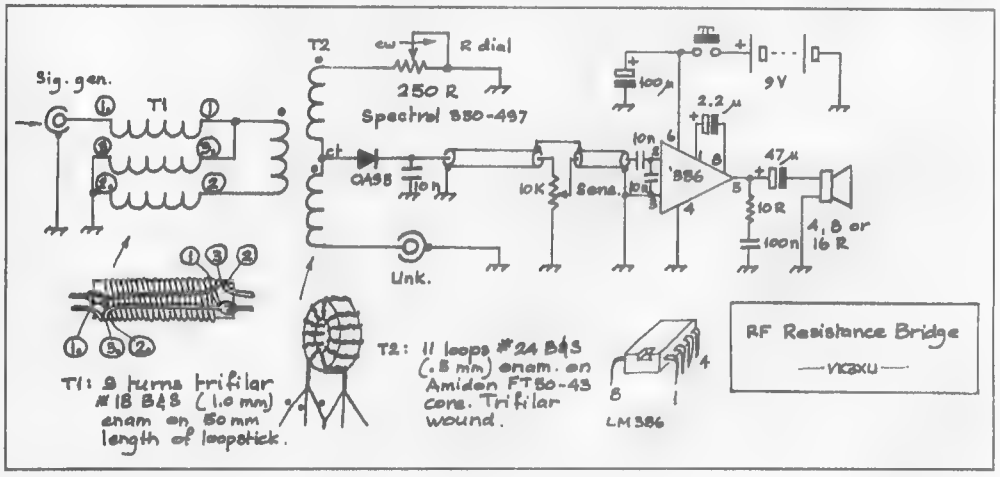


Fig 1 The circuit Diagram

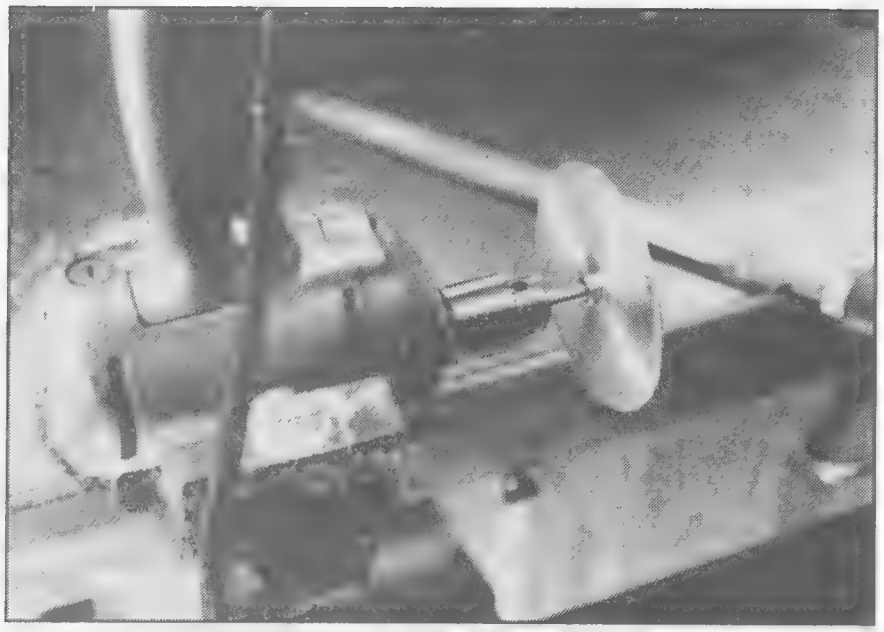


Photo 2 Smoothing the disk edges on a poor man's lathe.

Continued from page 25

To obtain good resistance resolution, the dial must be as large as can reasonably be managed. Mine is a white undercoat spray-painted aluminium disc measuring 100 mm diameter, thus taking the full width of the box. The 250R carbon pot is mounted centrally upon the main board assembly, with an extension shaft attached. The perspex cursor is affixed to the back of a suitable knob as shown in Photo 2. The dial disc components may be produced in the chuck of an ordinary electric drill. Compass, then cut out your aluminium and perspex discs using a rod-saw or similar. Drill a 1/4" hole dead centre of each. Take a 1/4" Whitworth bolt, about 2" long, and cut off the head. Fix the disc in this "chucking piece" using a pair of nuts and washers. Mount the drill in your bench vice as shown in Photo 3. Carefully apply a flat file to the outer edge of the rotating disc to obtain a smooth round finish.

The BNC socket connector for signal generator, on/off switch, miniature speaker and detector gain pot may be mounted upon one side panel as shown.

There is room for the 9 V "transistor" battery inside the box. Mine is mounted upon the bottom detachable panel with phenolic spacers. Or your battery may be fixed to a clip external to the box, depending on operational preference.

Calibration

Before applying power, go over your wiring and component polarities again and confirm that all is correct. Switch on. Full clockwise rotation of the gain pot should produce just a soft hiss. You will need an HF signal "generator" which can deliver about 1 mW, and has internal AM, such as the Q-1312. Connect the generator output to the RF connector of the bridge using a short coax cable.

Obtain a set of 1/4 W, 1 or 2% resistors of 10R, 100R (X4, to make 50, 100 and 25 ohms), 120R, 150R (X2, to make 150 and 75 ohms), 180R and 220R. Suggested calibration points are10, 25, 50, 75, 100, 120, 150, 180 and 220 ohms. Starting with the most popular impedance; 50 ohms, take two 100R resistors and solder them into a PL-259 (or whatever you prefer) plug using short leads. Set the generator to mid HF, say 14 MHz at about 1 mW (maximum level on the Q-1312). Switch the internal AM on. You will hear a tone. Carefully adjust the resistance dial for a null, which should be deep and quite sharp. With a pencil, mark this 50 ohm calibration point. Do the same for all other desired calibration points between 0 and 220 ohms. The null at the high end will not be as sharp as those obtained at the low end.

With all calibration points marked, remove the knob/cursor and apply calibrations to the dial disc using rub-on numbers or similar.

Operation

The bridge finds primary application in antenna work. If physically possible, the feed-point of the antenna is connected to directly to Unknown. Sweep the R dial around the nominal impedance whilst listening for a null. Also adjust the generator frequency for deepest null, then read off the resistance and resonant frequency. Let's suppose we want a ground plane with four sloping radials to be resonant at 14.1 MHz and present 50 ohms, but we read 40 ohms and 14.0 MHz. It's too long. Shorten each element a bit and measure frequency again. We could raise the impedance a little by increasing the angle of radial slope, and measure again. Check for inter-action between variables.

It's easy with a ground plane, because we can generally get at the feed point. What do we do with a more remote feed point? "Use an electrical half-wave (or multiple thereof) of low-loss coax feed-line" blithely say the radio handbooks. Hmmm. To do that we need to know the velocity factor (v) of the cable so that we can be sure of the electrical length. If the velocity factor is known then;

> Electrical 1/2 wavelength in metres = v multiplied by (150 divided by f MHz).
>
> For example, the coax maker gives v as 0.66, and we want 1/2 wave at 14.1 MHz,
>
> then; length = 0.66 X (150 divided by 14.1), which gives 7.02 m.

Before we go cutting up lengths of precious cable, we can measure the (v) of a sample. Connect one end of a sample length (say 6 m) of cable to "Unknown". Short circuit the far end (perhaps with an alligator clip). Set the R dial near zero (because zero ohms will be reflected over exactly 1/2 wavelength). Sweep the generator down from 30 MHz looking for the lowest frequency that produces a good null. Note the frequency. Calculate;

> Velocity factor = (length m multiplied by f MHz) divided by 150.
>
> For example; a 6 m sample length of coax has lowest null at exactly 16.5 MHz, then;
>
> v = (6 X 16.5) divided by 150, which gives 0.66.

Let's say at a hamfest you buy, at bargain price, a mystery coil of coax cable. The person who sold it to you "thinks" it is 50 ohm, but no one is sure. How to measure the characteristic impedance (Zo)? If it is very long, cut off a 3 or 4 metre sample length. Connect one end to "Unknown" using a suitable plug. Solder a miniature 220 ohm carbon trimpot, between one side and slider, to the far end. Set the generator to about 30 MHz. Repeatedly adjust both generator frequency and trimpot until the detected tone is constant (no dips or nulls), regardless of frequency. Now disconnect the coax from Unkown, and measure the trimpot's resistance with your multimeter. The value of the trimpot's resistance will equal the Zo of your cable. The same method may be used to find the Zo of any reasonable length of cable, both coax and twisted pair.

To find the value of an unknown microhenry coil; connect the coil IN

SERIES with a (say) 100 pF mica capacitor across the Unknown connector. Set the R dial to about 10 ohms. Vary the generator frequency and R dial until best null is obtained. Note the frequency. The value of the coil, in microhenries (μH) may be calculated:

L(μH) = 25330 divided by (f(MHz) squared X 100(pF)).

Similarly, when frequency and inductance are known;

C(pF) = 25330 divided by (f(MHz) squared X L(μH)).

To adjust an ASTU (or antenna coupler); replace the usual radio coax connection with Unknown of the bridge. Set the R dial to your coax impedance (typically 50 ohms). Set the generator to the required frequency. Now carefully adjust the ASTU, listening for a deep null in tone, then note the settings for each band of interest.

When working with large antennas, you may hear broadcast stations mixed with the tone (the detector acting as an un-tuned crystal set). Simply ignore the babble and concentrate on the tone, which may be nulled in the normal way.

Parts

The 250R carbon pot (carbonised plastic track- or "Cermet"), Spectrol P/N 350-497, is known to be available from Farnell (02 9645 8888). The same type is also available from Rockby Electronics (03 9562 8559), where the Cat. number is RB51X250R. Cost is about $6. See Hamads for Amidon core retailers. Dick Smiths, Jaycar and Truscotts have loopsick rod material for the balun (shorten by grinding a groove around the circumference then snap, as you would break a stick). The remaining parts are available from the usual electronics suppliers.

References and Further Reading:

1. "The Antenna Noise Bridge", Hart, W5QJR, QST, Dec. '67.
2. "A Review of Antenna Noise Bridges", Slutzkin, VK3SK, AR, Mar, Apr. May '81.
3. "A Few Tips On the Design of the Noise Bridge"; Butler, VK5BR, AR Feb. '90.
4. "Another Tip For Using the Noise Bridge"; Butler, VK5BR, AR Dec. '94.
5. "A Home-brew HF Balun", Diamond, AR, Oct '97.
6. Test Equipment for the Radio Amateur, Smith, G4FZH, RSGB Publications.
7. Radio Communication Handbook, 6th Edition, RSGB Publications.

ar

EDITOR
"Amateur Radio"

Mr Bill Rice has indicated his intention to retire towards the end of 1999.
Applications are invited for the position of Editor for *"Amateur Radio"*

The Editor will be appointed by Federal Council to be the Chairman of the Publications Committee. The Publications Committee is responsible for the publication of all WIA publications, subject to the direction of the Council and Executive. The Editor shall ensure that editorial policy of all publications is, in general, in accord with the policy of the WIA.

Applicants are expected to

- have a commitment to maintain and improve the quality of the present *"Amateur Radio"* magazine and other publications of the WIA
- be skilled in editorial and technical writing matters
- meet the regular deadlines involved in the timely production of a monthly magazine
- work with volunteers both on a one-to-one basis and in a Committee
- be available through email, phone and fax
- be licensed amateur radio operators and members of the WIA.

The Publications Committee is based in Melbourne and applicants outside of this area should not be deterred by this but need to advise on how they would work with this arrangement.

A small honorarium is provided to the Editor.

Applications should be forwarded to the Federal Office by 23 August 1999 addressed to Dr W J Howse, Director.

Enquires about the position can be made to him by phone and fax through the Federal Office or by email to armag@hotkey.net.au

FOR ALL YOUR COMMUNICATIONS NEEDS

Get in quick and grab a bargain! These ex-demo Yaesu transceivers may have a few minor marks or scratches, but you'll save a fortune. Warranty applies but stocks are strictly limited.

FT-51R 2m/70cm hand-held

The FT-51R uses a sculpted case and diecast rear panel for strength, and dual microprocessor control for ease of use. At just 57 x 123 x 26.5mm (W.H.D) including NiCad battery pack, it's comfortable to hold or clip in a pocket. Includes inbuilt "Spectrum Scope", scrolling text help messages, and power-saving MOSFET amplifiers.

Features:

- Tx 144-148, 430-450MHz
- Rx 118-174, 420-470MHz
- 2m RF Output: 2.0, 1.5, 0.5, 0.02W
- 70cm RF Output: 1.5, 0.5, 0.02W
- Twin VFOs per band
- 120 memory channels
- Dual-band & dual in-band receive facilities (VHF/VHF, VHF/UHF, UHF/UHF)
- DTMF Paging and Messaging
- Large illuminated LCD screen
- Auto battery saver, Auto battery off
- CTCSS encode/decode
- Australian version selectable Auto repeater shift
- Includes FNB-31 600mA/H NiCad, belt clip, AC charger, CA-9 charging stand and high efficiency antenna.

2 YEAR WARRANTY D 3622

$599 BELOW COST

3 UNITS ONLY

CD-2 mobile fast charger

A fast NiCad charger and mobile cradle assembly to suit the FT-11R and FT-51R handheld transceivers. Uses a regulated switched-mode charging circuit for cool operation and light weight. Reverts to trickle charging once the battery is fully charged. Includes cigarette lighter lead.

D 3628

10 PIECES ONLY

2 YEAR WARRANTY

$39.95 WAY BELOW COST!

Battery packs to suit FT-11R and FT-51R

FBA-14 dry cell case	D 3626	$19.95	SAVE $40
FNB-35 7.5V 900mAH NiCad	D 3624	$59.95	SAVE $30
FNB-33 4.8V 1200mAH NiCad	D 3623	$69.95	SAVE $37

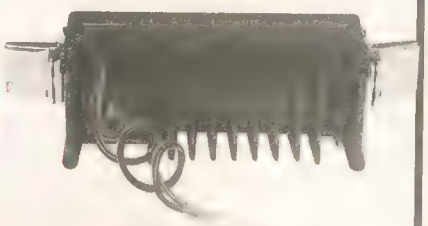
FL-2025 2m 25W Amp

Turn your FT-290II into a powerful mobile/base transceiver with this bolt-on RF amplifier. Replacing the FBA-8 battery holder on the FT-290RII, it boosts transceiver output to 25 watts. Requires 13.8V DC.

D 2863

LAST FEW UNITS

$199 SAVE $100



FT-290RII 2m all-mode transportable

Covers 144-148MHz and features FM, SSB (USB/LSB), & CW operation with 2.5W or 250mW switchable output power, twin VFOs and 10 memories that store mode and simplex or repeater frequencies. Selectable tuning rates are also provided for SSB/CW and FM (SSB- 25Hz/100Hz/ 2.5kHz and 100kHz; FM-5/10/20kHz and 1MHz). Mode specific features include a noise blanker and clarifier control for SSB/CW, plus a full set of functions for FM repeater operation, making this unit very simple to operate. It comes with a flexible rubber antenna, an FBA-8 battery holder which takes 9 x C size batteries (standard or NiCad) and a hand-held microphone.

D 2875

YAESU

2 UNITS ONLY

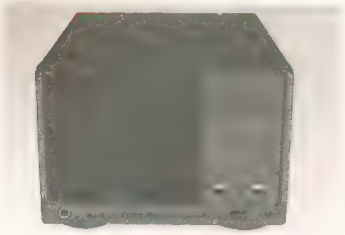
2 YEAR WARRANTY

$699 SAVE $200

SP-6 Extension Desk Speaker

With 12 different audio filtering selections, this speaker set suits most transceivers and receivers. A selectable high/low pass filter coupled with a large high-sensitivity speaker produces superior audio compared to that of standard transceiver speakers. The SP-6 has two input terminals with front panel selection, and a front panel headphone socket with filtered audio.

D 3265



2 YEAR WARRANTY

3 PIECES ONLY

$169 SAVE $80

Mastercharger I Fast Desktop Charger

The Mastercharger I is a compact fast charger that operates from 13.5V DC and uses switch-mode technology plus a Philips battery charge monitor I.C. to charge NiCad batteries between 4.8V and 13.2V. Suits Yaesu FT-23, 73, 411, 41 le, 26, 415, 815 and 530 handhelds. The charging cradle on each MasterCharger can easily be replaced, allowing for the insertion of a new cradle to suit other transceivers. Requires 12-15V DC at 1.5A, and comes with a fused cigarette lighter cable.

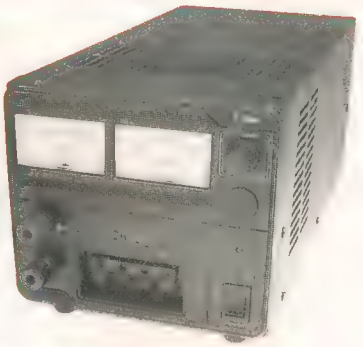
D 3850

$39.95 WAY BELOW COST!

FOR ALL YOUR COMMUNICATIONS NEEDS

3-15V 25A Heavy Duty Power Supply

This solidly built benchtop power supply provides current of up to 25 amps ICAS at 15V, 20 amp continuous at 13.8V and lower current at lower voltages. It has front panel metering plus high current banana-style and low-current output connections. An internal heatsink and thermally switched fan provides cooling without protrusions in the metal case. Specially modified for more reliable long-term operation, it uses a rugged 50 amp bridge rectifier & trifilar transformer. Also provided is extensive overload protection through dissipation limiting circuitry for the pass transistors, a 30 amp instantaneous current limit, AC mains circuit breaker, a transformer thermal fuse & fused auxiliary secondary winding.
D 3800



$299
GREAT VALUE!

Yaesu FT-100 HF/6m/2m/70cm Mobile

What amazing value! Now you can enjoy the fun of operating on all bands from 160m to 70cm, either at home or in your car. The new Yaesu FT-100 features HF/6m/2m/70cm transmitter coverage, with 100W PEP RF output on HF and 6m, 50W on 2m and 20W on 70cm, plus you can easily mount the detachable front panel using an optional lead for more convenient mobile installations. Powerful interference fighting features, such as a DSP based Bandpass filter, Notch filter and Noise reduction, together with an IF based Shift control, all aid reception quality during tough conditions. A speech processor and VOX are provided for SSB users and an internal electronic keyer is provided for CW operation. Also included are dual VFOs, built-in CTCSS encode, 300 memory channels, all-mode operation (SSB, CW, AM, FM, AFSK, Packet (1200/9600bps), 100kHz - 970MHz receiver (cellular locked-out) and options for additional AM and CW IF filters. The FT-100 is supplied with an MH-42B6JS hand mic, DC power lead and comprehensive instructions.
D3285
2 year warranty
YSK-100 Separation Kit D 3286 **$155**

STOCKS DUE MID JULY

YAESU $2750

Yaesu FT-1000MP Deluxe HF All Mode Transceiver

Yaesu has created a new 100W HF masterpiece using proven design techniques and a major new technology to the amateur marketplace: Enhanced Digital Signal Processing (EDSP). Teamed up with Direct Digital Synthesis, an outstanding receiver section featuring a high intercept front-end and a variety of IF filters (including a Collins Mechanical Filter), the FT-1000MP's exclusive EDSP facilities provide an impressive array of IF-based noise-reduction and interference reduction filters for enhanced receiver performance. Yaesu's IF-based EDSP system provides 4 random noise-reduction protocols, audio enhancement with 4 equalisation programs for Tx and 3 for Rx, and an automatic notch filter which eliminates multiple interfering carriers. A comprehensive menu system allows you to easily hear the effect of various EDSP settings, so you can choose the best selection for your operating conditions. Front panel selectable EDSP filter contours also aid QRM rejection, providing improved signal-to-noise ratios and razor sharp selectivity. The FT-1000MP also features selectable receiver front-ends, an in-built AC power supply and auto antenna tuner, 2 main antenna sockets, selectable tuning steps as small as 0.625Hz, dual-mode noise blankers, 13.8V DC socket, 500Hz and 6kHz IF crystal filters, an RS-232 computer interface and an MH-31B8 hand microphone. With so many features in this new transceiver, why not ask for a copy of the 12-page FT-1000MP colour brochure or 46-page Technical overview for more detailed information.
D 3400

2 year warranty

$4450

YAESU

PHONE FAX AND MAIL ORDERS

direct link

PHONE: **WITHIN AUSTRALIA: 1300 366 644**
(Local call charge)

FAX: **(02) 9395 1155** within Australia and
(+612) 9395 1155 from outside Australia

Visit our web site at http://www.dse.com.au

MAIL: **DICK SMITH ELECTRONICS,** Direct Link, Reply Paid 160,
PO Box 321, North Ryde NSW 1670 (No stamp required)

Excludes packaging and postage. All major credit cards accepted.
14 Day Money Back Guaranteed if NOT completely satisfied. (Software excluded)

DICK SMITH ELECTRONICS

That's where you go!

A 230-B 3973 DPS

Mike Impedance Matcher

Bob Harper VK4KNH
PO Box 288
Beerwah 4519
Bobharper@bigpond.com

Recently I had a request from a non-amateur to convert his CB microphone to 50 k-ohms. We can but guess what he was going to do with it. I fixed his problem than considered that as radio microphones are usually either 600 ohms or 50 k-ohms that I should make a pre-amplifier with a dual impedance input and variable gain from 1 to 10. Although this could be the first stage in a speech processor, I haven't followed that path here.

The circuit is a simple, single-supply op-amp circuit with variable gain and a high/low impedance switch on the input. I personally believe that Amateur Radio should be a learning experience and as such will describe the purpose of every component used. That must be the ex-teacher coming out in me.

Active Component Choice

Referring to Figure 1, the Op-amp chosen is a TL071, FET input, low noise type, which has a high input impedance. An LM741, or other op-amp could be used with reasonable results but the one chosen is well suited to the task, readily available and cheap at around $2.00 from most outlets.

Power

Power is connected to the op-amp at pin 7 and pin 4 is the ground connection. C3 filters out audio frequency ripple that may appear on the power supply either from external sources or generated within the op-amp. The signal simply passes to ground via C3 resulting in almost no ripple on the supply rail.

Op-amp signals should be biased mid-way between the rail voltages and that is why they are usually fed with a dual power supply of something like +/-9V. When there is only a single supply rail the input pins should be biased at a voltage midway between the supply and ground. The two 100 k-ohm resistors, R3 and R4, do just that in this circuit.

You will also have noticed the R5/C2 combination. This is another filter to prevent any audio ripple still remaining on the power supply from reaching R3 and R4 and thus being amplified.

Input Circuit

There are three circuits for the input that can be chosen by the switch. The first input, switch position one, is a direct input allowing for an input impedance of 50 k-ohms, which is set by the value of R3 in parallel with R4. We could match the input to another impedance by using suitable resistors for R3 and R4.

Note that I refer to R3 and R4 as being in parallel only as far as the audio signal is concerned. The impedance of any power supply capacitor would be almost zero at audio frequencies, thus R3 and R4 appear to the audio signals to be in parallel. (C2 would be about 50 ohms at 300 Hz.)

The second input, switch position 2, is around 600 ohms set by switching R1 across the microphone input. R1 is in parallel with R3 and R4 making the input impedance a little under 620 ohms.

The third input, switch position 3, is provided for the electret microphone element. Electrets require a small current through them to operate. Generally this is less that 0.5 mA. At a rail voltage of 12 volts the resistor required is 12/0.0005 or 60 k-ohms. A 68 k-ohm value should be sufficient.

The capacitor C1 is calculated to have little effect on the circuit at the lowest frequency. In this case the current that will flow in the capacitor will be very small and even 1 k-ohm would be a low resistance. The impedance of a 1uF capacitor would be around 500 ohm at 300 Hz falling to around 50 ohms at 3 kHz. This generally considered acceptable but could be increased to 10uF if better performance with a 600 ohm microphone is required. The reactances would then be reduced by a factor of ten.

Feedback Circuit

An op-amp has two inputs; an inverting input, (often pin 2) and a non-inverting input, (often pin 3). You can simply think of these as for negative feedback and positive feedback respectively. Note that in this circuit, there is no feedback between the output on pin 6 and the input on pin 3; ie there is no positive feedback.

Pin 2 however is connected to pin 6 via the 100 k-ohm potentiometer, VR1. At DC and very low frequencies C4 is essentially an open circuit. The op-amp draws so little current that pin 2 is effectively connected directly to pin 6 and the DC feedback is 100%. This means a gain of one, which is fine for us, as we didn't want any gain at DC anyway.

At audio frequencies the impedance of C4 will be very low, 53 ohms at 300 Hz, and falling as frequency increases. The feedback will depend on the resistance ratio on each side of the wiper of VR1. At minimum with the wiper closer to the output of the op-amp, the gain will be one. With VR1 at full resistance of 100 k-ohms, the gain will be 100k/10k = 10.

Output Circuit

The output circuit simply consists of a 1k-ohm resistor, R6, that restricts the loading on the op-amp to 12 mA at 12 volts, and a capacitor, C5, that prevents any DC voltages from passing between the amplifier and the radio. The impedance of C5 will be just 53 ohms at 300 Hz.

Construction

As with any project that will operate within a radio shack or near radio energy (in EM Fields), the circuit must be well shielded and be well bypassed. Keep the lead lengths short. If this circuit is constructed in a suitable metal enclosure using standard shielded audio cable, there should be no problems. It can be made on strip-board, vero-board, perf-board, a home etched PCB or dead bug style with success.

One sample has been made on a piece of strip-board about ten holes square. It was placed inside the head of a desk mike after the original transistor circuit was found to be dead. Keep the input and output circuits apart however as the high impedance allows the thing to pick up some quite small signals. Resistors can be 1/8th watt up and capacitors can be either electrolytic or tantalum. It would also run from a single 9 volt transistor battery although I haven't calculated or measured the current draw. It should be no more than 10 mA at a guess and could be around 2.5 mA.

Testing

Always check your connections and polarities especially the IC and the electrolytics. Connect the 12 volt supply and measure the voltage to ground from pins 2, 3 and 6. They should all be around six volts but more importantly, they should all be the same. If not, turn it off immediately and check your connections again. Connect a microphone to the input and a speaker on the output and gently blow into the mike. You should hear your breath on the speaker. Don't expect a high noise level, the speaker is only 8 ohms attached to a 1 k-ohm resistor.

If all tests out OK, then you have your microphone impedance matcher/pre-amplifier. Get some on air reports and avoid overdriving the radio. Above all else, do it yourself, learn a little and have fun.

BI

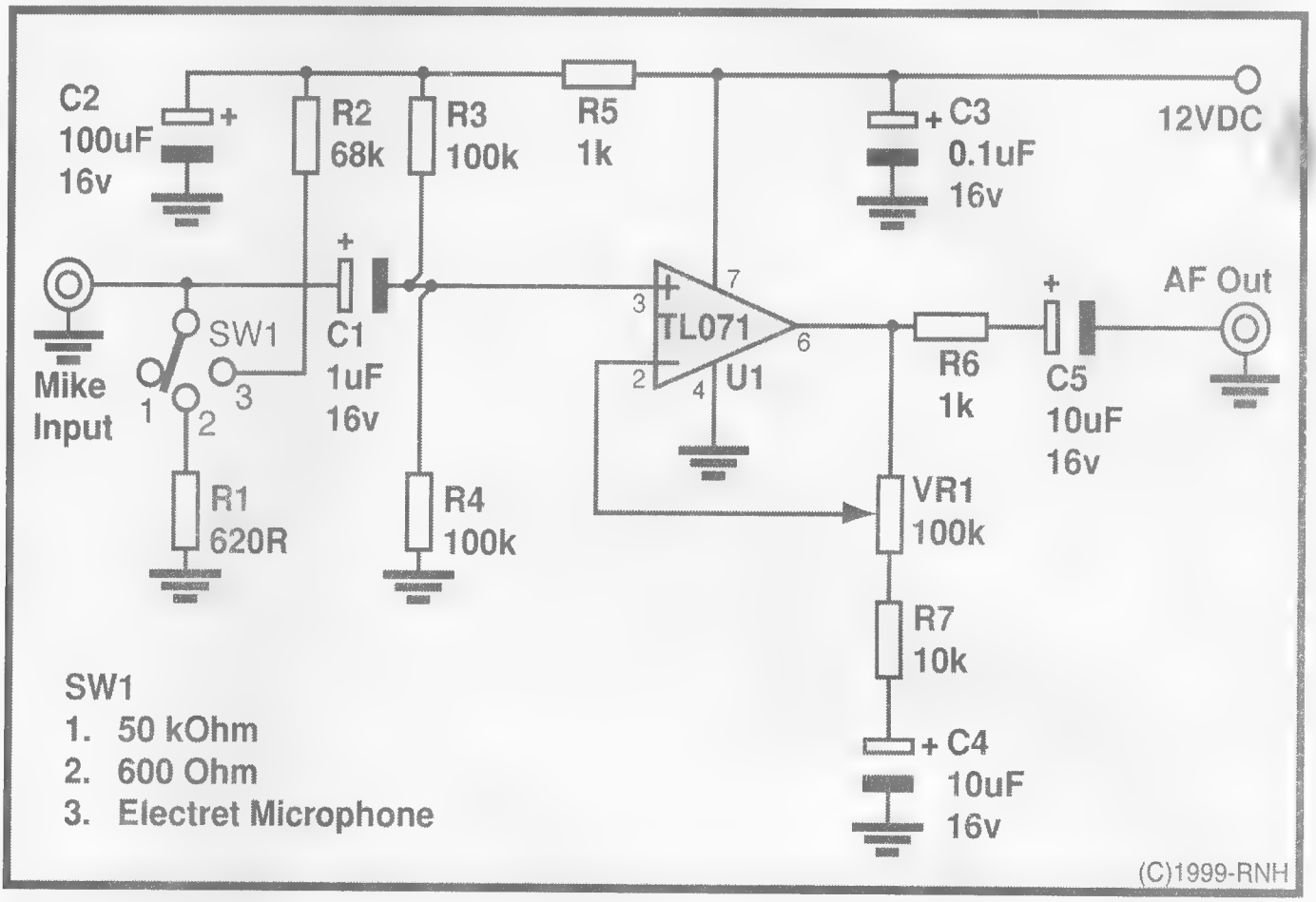


Figure 1

SNIPPITS

Peals of thunder

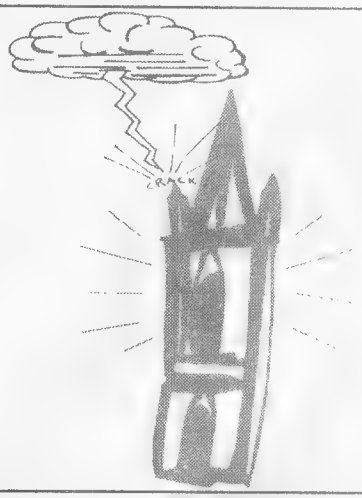
In the middle-ages it was common practice to ring peals of church bells to disperse the thunder from approaching storms.

It was not until 1786 that the practice ceased after the Parliament of Paris enforced an edict forbidding the practice.

It was noted by that parliament that 103 bell ringers had been killed in just thirty-three years.

A British army edict of the same period forbid the storage of gunpowder in bell towers due to almost 400 reported lightning strikes on bell towers.

Gunpowder stored in the bell tower in an Italian village was hit by lightning, resulting an explosion that flattened 190 houses.



TECHNICAL ABSTRACTS

Gil Sones VK3AUI
30 Moore Street
Box Hill South Vic 3128

End Fed Antenna

Amateurs often use the end fed antenna when it is difficult to use one of the more usual antennas. It is often somewhat difficult to obtain good performance with random length end fed wires. An article appeared in Communications Quarterly Spring 1998 that was a reprint of an original article in RadCom September 1994 titled "Taming the End Fed Antenna". The author was the late Alan Chester G3CCB who explained how to tailor the end fed wire to give multiband performance.

The key to understanding the performance and feeding of the antenna is shown in Fig 1. This impedance characteristic is repeated as the wire operates at higher harmonics. The end fire directivity becomes more prominent as the ratio of wavelengths to wire length increases.

The Earth also plays an important role in the end fed antenna. A stake may be convenient for a portable operation but it is not very efficient. For a fixed location the Earth stake should only be used as a safety Earth. A counterpoise or an array of quarter wave ground radials would be better. Use at least one quarter wave radial for each band of operation. They can be run on the ground preferably in a straight line but around corners if necessary.

Avoid half wave points when matching as the impedance is quite high and changes very rapidly with slight changes in frequency that can make matching and changing frequencies tedious. It is best to use wire lengths that are at least an eighth wave longer or shorter than half wavelengths or multiple half-wave lengths. Matching will be easier and may often be accomplished by the addition of a series L or C element and an impedance matching transformer.

A chart showing antenna wire lengths with unsuitable lengths indicated by bars are shown in Fig 2. The chart may be used to select suitable wire lengths for the combination of bands and space available. This chart is simply an application of Fig 1. The end effect is not included in Fig 2 and lengths will require some trimming when first setting up. The chart does give a good starting point however. Using the chart the author selected three typical wire lengths and provided tuning and matching data in Table 1.

Fig 3 shows a simplified layout for a typical application. An isolator is placed between the matching transformer and the transceiver cable to isolate the radio from the antenna system. This avoids having the shack hot with RF. The transceiver can be some distance from the feed point but the matching should be close to the wire end. Avoid coupling RF onto other cables by using snap on Ferrite chokes on those cables. This can be a greater problem when the transceiver is closer to the feedpoint.

The impedance at the feedpoint is matched to the coax and the radio by the use of a multi-tapped toroidal matching transformer. Several have been described in recent years and they are also available commercially.

Similarly the isolator can be a simple choke formed by making several turns of the coax through a ferrite core or you could use a commercially produced unit.

The wire is in the region of a half wave multiple on 10 metres for all of the three examples given. The answer is to use a tuned circuit to match the wire on 10 metres. The author used a 25 pF variable capacitor across a four turn centre tapped coil made in 18 gauge wire on a T130-6 powdered iron core. See Fig 3.

By referring to Table 1 it can be seen that the 15 metre wire can be tuned on all but the 160 m and 15 m bands with only capacitive tuning. If a second 10 metre wire length is used the 15 m band can also be tuned by capacitor and therefore avoid tunable inductances.

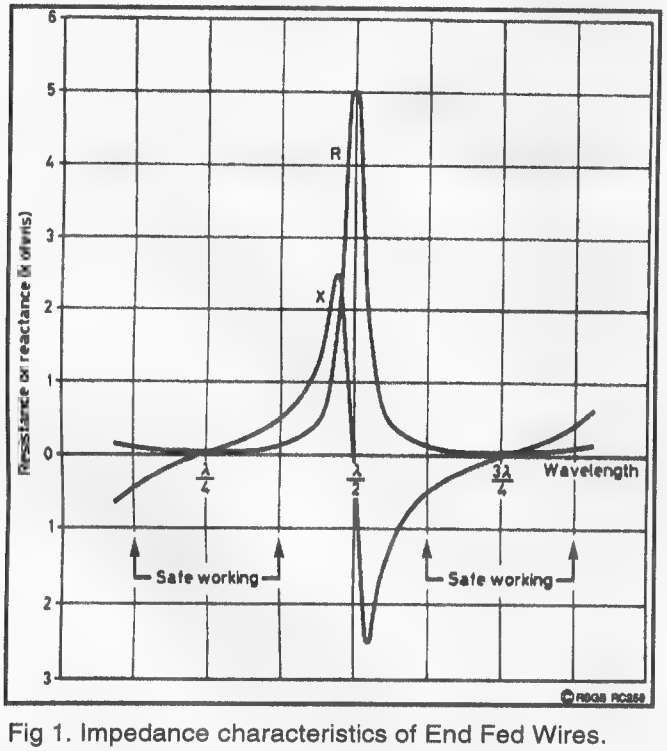


Fig 1. Impedance characteristics of End Fed Wires.

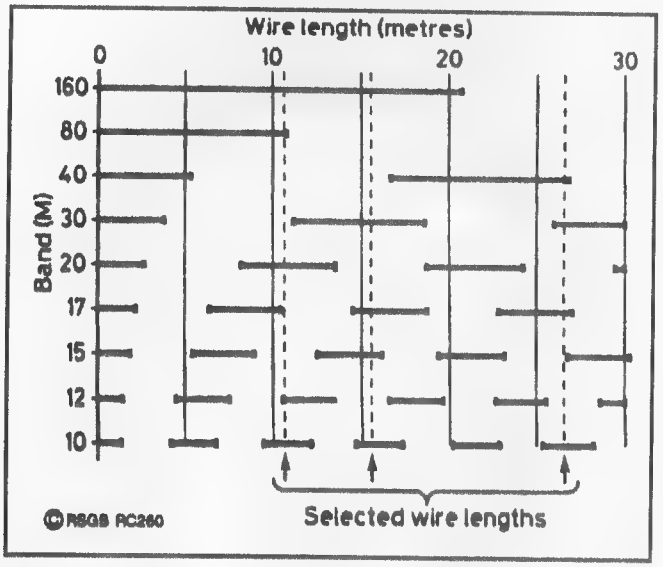


Fig 2. Wire lengths suitable to End Fed Wires. Black Bars are no go.

An Inductive Variometer

A Variometer may be used as the variable inductance in an antenna tuning circuit instead the more usual Tapped Inductor or Roller Inductor. This approach was described in the January 1999 CQ Ham Radio by 7K3GRX. The tuner was used to match a short whip and a counterpoise of three short radials on the 7 MHz band. The variometer used provided an inductance in the range from 16 to 34.7 µH.

Two concentric coils are used with 8 turns of 1.2 mm copper winding wire on each. The inner coil is wound on a 100-mm diameter perspex former while the outer is wound on a 150-mm perspex former. The coils are each spaced over 30mm length with a gap in the middle of each coil to allow a 6 mm diameter plastic shaft to fit through. Brass or Aluminium rod or tube could also be used.

The inner coil is rotated perpendicular to its axis through 180 degrees. Therefore the inner coil changes from being wound in the same direction to the outer coil when the inductance is greatest to being wound in the opposite direction to the outer coil when the inductance is least.

The inductance of the individual coils are 15.6 µH for the larger coil and 8.9 µH for the smaller coil but taking the mutual inductance into account the inductance changes almost linearly from 34.7 µH with both coils "in line" to 16 µH "in opposition".

The coils and the inductance plot are shown in figure 4 and the tuner is shown in figure 5. The input isolator consists of 13 turns of thin coax wound on a small toroid. This isolates the RF from the outer of the coax, which might result when short counterpoise are used. The setup of transceiver and antenna are shown in figure 6.

The tuner uses a combination of fixed and variable capacitors with the variable inductance, variometer, in an L Match configuration.

Screwdriver Antenna

RadCom of February 1999 contained an article with the intriguing title of The Screwdriver Rapid QRV Antenna. The article was translated and edited by Erwin David G4LQI from the original that appeared in Electron by Dr Louis Stuyt PA3BTN and Hans Spits PD0NCF. The article described the use of a tunable whip antenna design from Don K Johnson W6AAQ. The screwdriver mentioned in the title comes from the use at one stage of an electric screwdriver as the drive for the remote adjusting system.

The adjustable whip system is commercially available and is possibly available in Australia from Ray Naughton VK3ATN at ATN Antennas at Birchip in Victoria. The article used a system built by the

Continued on page 34

Tuning and Matching Data

Band (meters)	Tune	Match (ohms)	Notes
25.60-meter wire			
160	32–10 µH	50	Various ground planes
80	150 pF	112	
40	6 µH	112	
30	50 pF	200	
20	>100 pF	112	Near series resonance
17	2 µH	200	
15	25 pF	450	
12	>50 pF	112	Near series resonance
10	1 µH/25 pF	800	Parallel resonance (see text)
15-meter wire			
80	14 10 µH	25 50	
40	100 pF	50	
20	>50 pF	112	Near series resonance
17	25 pF	450	
15	4 µH	450	
12	>50 pF	450	Near series resonance
10	1 µH/25 pF	800	Parallel resonance (see text)
10-meter wire			
80	20–14 µH	25–50	
40	>100 pF	50	Near series resonance
30	50 pF	200	
17	2 µH	112	
15	>50 pF	200	Near series resonance
12	25 pF	450	
10	1 µH/25 pF	800	Parallel resonance (see text)

Table 1. Tuning and Matching Data for three example wire lengths.

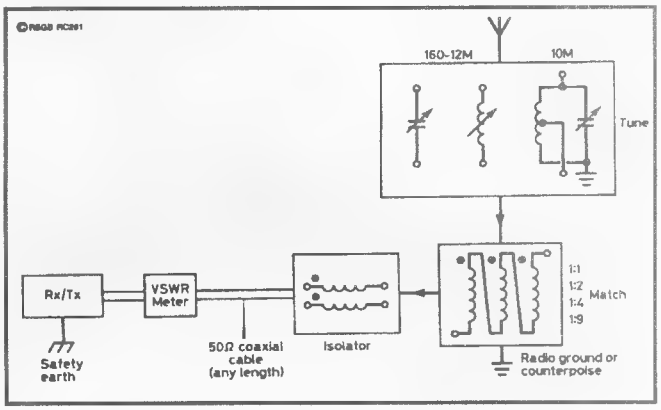


Fig 3. Layout of antenna to transceiver matching components.

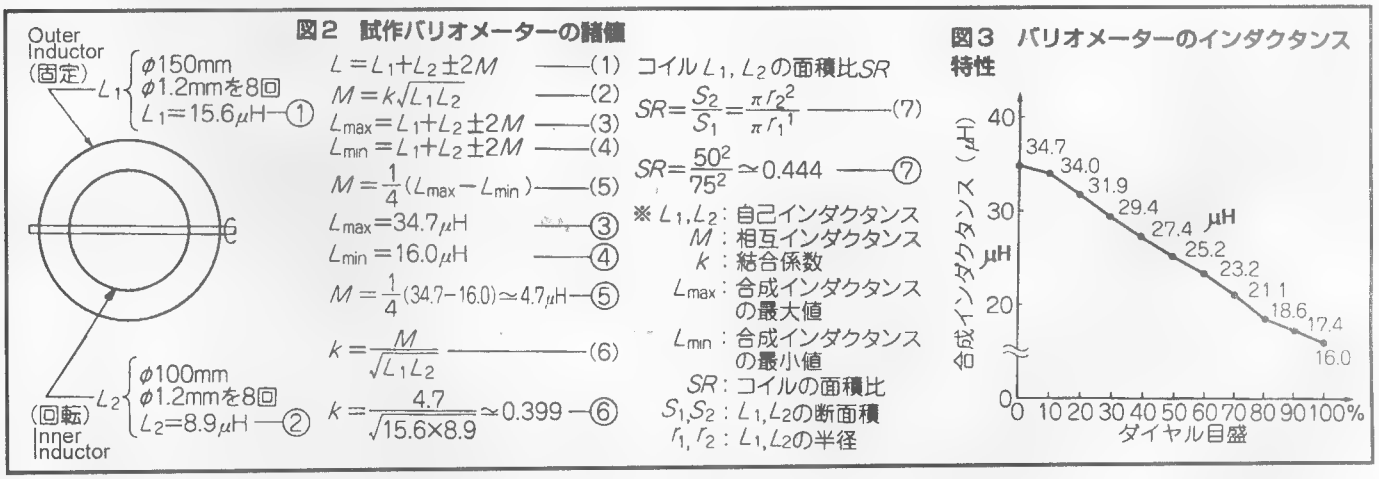


Fig 4. Variometer

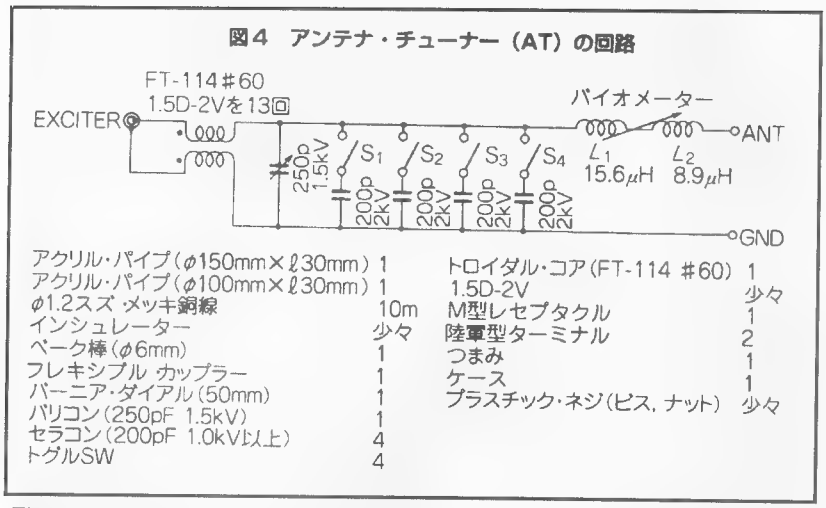


Fig 5. Antenna Tuner

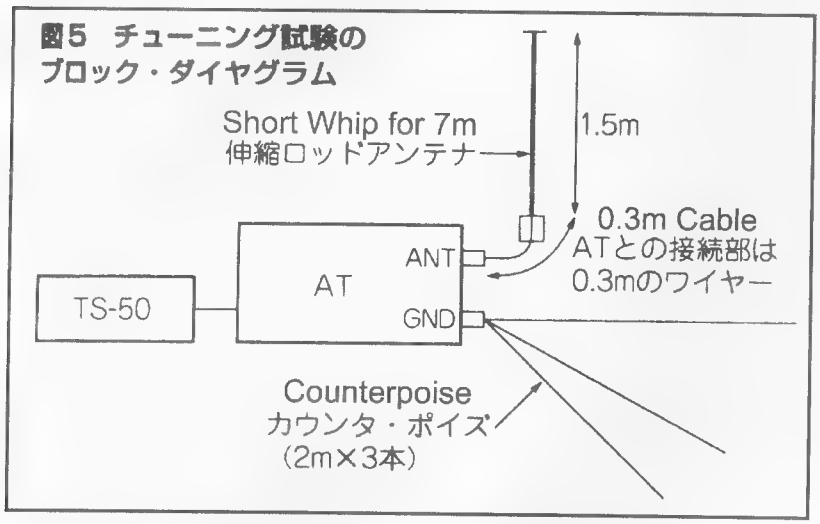


Fig 6. Transceiver - Antenna match layout

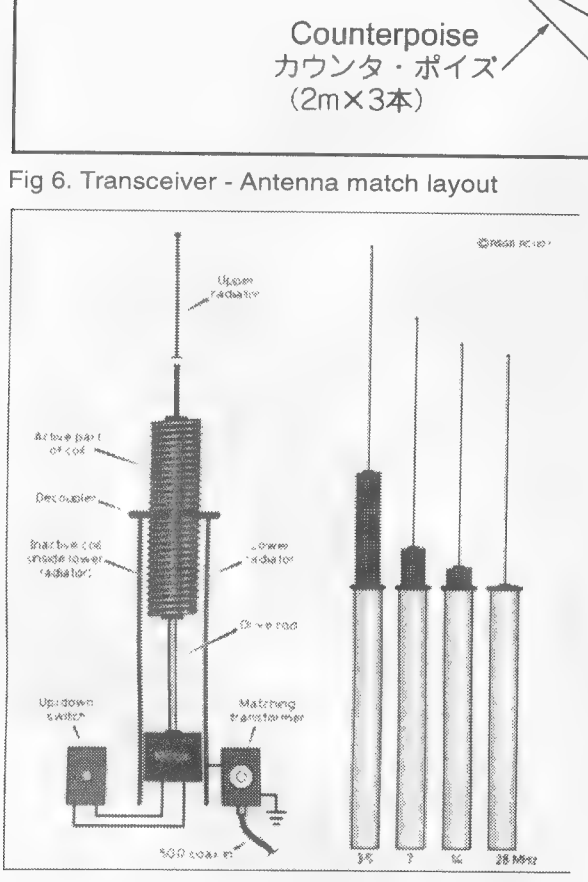


Fig 7. W6AAQ's DK3 continuously tunable 3.5 - 29 MHz mobile Antenna

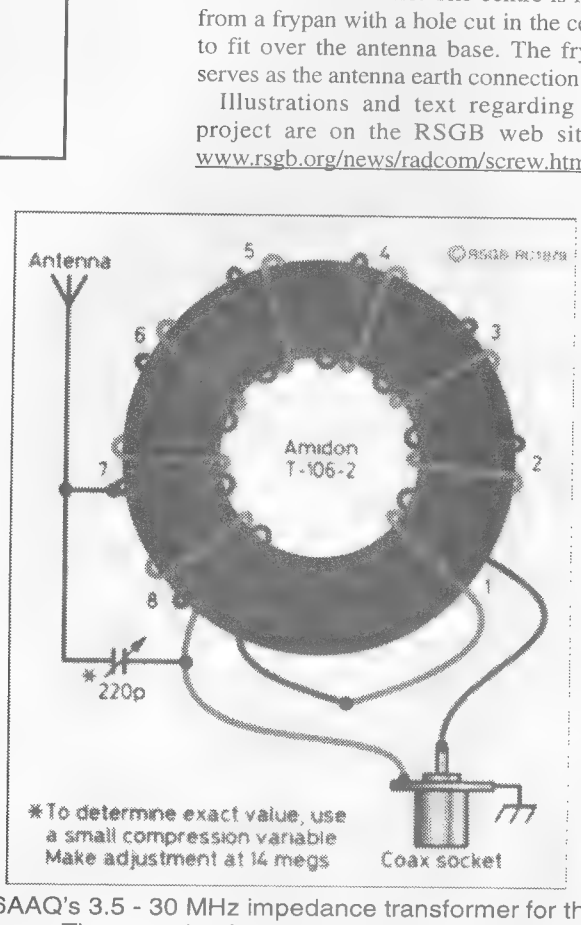


Fig 8. W6AAQ's 3.5 - 30 MHz impedance transformer for the DK3 antenna. The capacitor is only significant above 10 MHz.

Continued from page 33

authors but this course of action should only be attempted by those with a reasonable machine shop and the skill to use it.

The whip is shown in Fig 7. The coil is housed within the lower tubular section of the whip and is driven up through the top of the lower section through a ring of finger stock. Thus the lower section of the coil is shorted out and shielded. Only the top exposed section of the coil is active. RF is loaded into the lower section via a toroidal transformer shown in Fig 8. The capacitor is used for compensation on higher bands. The coil provides a centre loading to the lower housing and upper whip. In the article various lengths and types of whip ranging from a telescopic whip to a 10 mm aluminium rod with an optional top hat -for formal occasions no doubt!

The whip assembly was made to mount on the base of a fold up clothesline. The antenna was used with a counterpoise made up of sixty radials each 2.5 metres long. These were arranged into four groups of fifteen with their outer ends stapled to hinged wooden battens that fold into a "W" shape for storage.

The radials are all connected at the batten ends and also at two places between the battens and the centre. The centre is made from a frypan with a hole cut in the centre to fit over the antenna base. The frypan serves as the antenna earth connection.

Illustrations and text regarding this project are on the RSGB web site at www.rsgb.org/news/radcom/screw.htm.

VHF UHF AN EXPANDING WORLD

Eric Jamieson VK5LP
PO Box 169 Meningie South Australia 5264
E-mail: vk5lp@lm.net.au Fax: 08 8575 1777
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC

All times are UTC

Paul Lieb, KH6HME- VHF/UHF Pioneer

So little occurred on the bands this month that I looked like being left with a large space. Fortunately, when Emil W3EP sent me his July *QST* notes for *The World Above 50 MHz,* his lead article mentioned Paul Lieb KH6HME. Paul holds one half of all US records from 144 MHz to 5.7 GHz, with those from 432 MHz to 5.7 GHz as World Terrestrial Records -a great achievement.

With permission to reprint granted by **Emil Pocock W3EP** of *The World Above 50 MHz* in *QST* (July 1999 issue) and by the editor of *QST* **Mark Wilson K1RO,** the following should make interesting reading. It has not been placed in italics.

The Dayton Hamvention honoured **Paul Lieb, KH6HME,** on May 15 with its Special Achievement Award for his "pioneering and record-setting work in tropospheric ducting and VHF, UHF and microwave communications." He is best known for the many hundreds of contacts he has made from Hawaii to the mainland of North America on 144 MHz through 5.7 GHz over the past twenty years. As a consequence of his activities, Paul has been on one end of world tropospheric ducting distance records on eight different bands at 144 MHz and higher and made the initial Hawaii-to-North America contacts on six of them. So how did Paul Lieb get started on this pioneering work in the world above 50 MHz?

Young Radio Experimenter

Paul grew up in Anaheim, California, the son of an electrical contractor and sold RCA radios during the 1920s, when it was the newest rage. Five-year old Paul built a crystal receiving set and was delighted to pick up nearby KFI from Los Angeles. By the time he was ten years old in 1937, Paul had added a tuned circuit that allowed him to explore the adjacent amateur band at 160 meters. There he heard his first amateur radio station, W6DYG, operated by his neighbour Clarence Keilor. Paul became an occasional visitor to the W6DYG shack and eventually made his radio debut by speaking into the station microphone.

Paul's first transmitter, an unlicensed single no 27 tube RF oscillator built from a radio handbook design, could be heard a short distance away on the broadcast band.

About the time the war broke out, Paul bought a used 5-tube receiver for $4.25 from Western Auto with earnings of 15c an hour mowing lawns and a newspaper route. With driver's license in hand when he turned 14, Paul expanded his newspaper delivery into a 250-subscriber autoroute. Paul also repaired radio during the war years, learning mostly by reading and tinkering on his own. He graduated from Anaheim High School in 1945.

Paul continued experimenting with radios and served in the Air Force during the Korean War. He hoped to get electronics training, but a captain commandeered him as a personal clerk, based on Paul's typing, and made sure he was promoted to master sergeant by the time he was mustered out two years later. Soon afterward, Paul lived in St Louis, where he passed the exams for the new Novice and Technician class licenses. In 1953, Paul received his first call - W0NRI.

K6IZT and the Heady Years of VHF

Back in Anaheim a year later, Paul became K6IZT and was immediately thrown into the exploding world of VHF. His first rigs were modulated oscillators and super-regenerative receivers, the easiest way to get started on the VHF and UHF bands during the 1940s and early 1950s. Those unstable wide-band rigs with their radiating receivers soon gave way to converted military gear, which was especially abundant on the surplus markets in Southern California. No piece of equipment was more popular for getting on two meters than the SCR-522 set, which could put out a few watts of crystal controlled AM or CW.

Paul was soon on the air with his own converted SCR-522 rig. He operated almost exclusively from a portable location at Huntington Beach, with Yagis installed on an abandoned oil well derrick. Paul constructed coaxial feed line using 1/2-inch pipe and 1/4-inch tubing pipe to reach the top, later replaced with FAA surplus RG-17U. He could make regular contacts 125 miles north to Bakersfield. Paul also built a 100 watt 9913 tube amplifier and was on 432 MHz with a tripler strip. He operated the VHF contests and sometimes W6WSQ joined him at the beachfront shack.

Paul was one of the founders of the San Bernardino Microwave Society in 1955, and he also knew John Chambers, W6NLZ, before John began his famous series of experiments with Tommy Thomas, KH6UK, that led to the first Hawaii-to-California contact on 144 MHz in 1957. KH6UK and W6NLZ duplicated their feat on 220 MHz two years later, but they did not pursue the work at any higher frequencies. Paul remembered those experiments, but it was many years later before he picked up where they had left off. Paul is now the custodian of the two-meter equipment W6NLZ used to make the historic first trans-Pacific contact.

Mauna Loa

Paul's move to Hawaii came later, as a result of his work for an electrical contractor. In 1967, his employer sent him to Hawaii to fulfil a contract. Paul liked what he saw and decided to move there two years later. He finally traded in his California call for KH6HME by 1979, about the same time he put the first of a series of VHF and UHF beacons on the air from Hawaii.

Paul had been looking for a likely high spot for beacons that could be beamed toward California. By chance, he found a television relay station on the eastern side of Mauna Loa, at about 8,200 feet. The peak soars to 13,680 feet, but the relay site seemed ideal. There was a short tower and a small shack, it had electricity, and there was a dirt road (later paved) at least that far. After a few phone calls and gentle persuasion, he got permission to install a low-power 432 MHz beacon at the relay site in April 1979. Over the years, his relations with the owners remained cordial, no doubt smoothed by the occasional electrical work Paul undertook.

Paul did not have to wait long for results. In mid-July, Louis Anciaux, WB6NMT, heard the 432 MHz signal from his San Diego home and alerted Paul on the telephone. Louis waited an agonising several hours before Paul drove up the slopes of Mauna Loa to his new beacon and operating location. Then with relative ease,

Continued on page 36

Continued from page 35

the pair completed a historic 432 MHz contact on July 18, the first ever on that band to span the 2,530 miles between Hawaii and the mainland. That made three bands on which trans-Pacific contact had been made. Could the trans-Pacific duct support such extraordinary paths on even higher frequencies?

That became Paul's quest. The next year, he put up a beacon on 1296 MHz, but four years passed before he made a mainland contact on that band, this time with Chip Angle, N6CA. Chip soon provided Paul with complete home-brew stations on the microwave bands. Each in turn has yielded historic trans-Pacific contacts. Indeed, N6CA went on to make initial contacts with KH6HME on all the remaining bands through 5.7 GHz. (See Table)

In 1981, Paul put up his third beacon from Mauna Loa on 144 MHz. Over the following years, this has become the most popular and often heard of the group. A telephone call from a mainland operator with news that the beacon was being heard on the West Coast sent Paul on the two or three-hour drive up the mountain. On countless occasions, Paul took food and water for stays that sometimes stretched into days. He typically worked all comers on 144 MHz so long as conditions lasted. Sometimes he has switched over to two-meter FM simplex to provide even more operators the chance to make an unusual contact across thousands of miles of ocean. Paul has even worked stations using nothing more than a hand-held rig.

KH6HME has never run more than 100 watts on any band to make trans-Pacific ducting contacts. All the antennas are fixed on California. On 144 MHz, Paul has found just 60 watts to two 7-element Yagis are quite sufficient for the 2,500-mile contacts. He has a single 5-element Yagi on 222 MHz with similar power. The station on 432 MHz runs 100 watts into two 22-element Yagis. There is an 18-element loop Yagi for 902 MHz. On 1296 MHz, Paul gets 10 watts from a 2C39 amplifier and uses four 25-element loop Yagis stacked vertically. The 2.3, 5.7, and 10 GHz stations all run just a few watts and share a 4-foot dish. The KH6HME (BK29go) 144.170 and 432.075 MHz beacons runs continuously using the same equipment.

The distances spanned on the two more popular bands have crept upward as 2-meter stations as far north as Washington State and south into Baja California made it to Hawaii. Jack Henry, N6XQ, has been among the most active in operating from portable locations along the Baja coast, but he has nearly run out of useable coastline. The single longest contact is currently 4,333 km, made on 144 MHz, but there is good reason to believe this distance can be exceeded on several bands with contacts into British Columbia or further south along the coast of Mexico. There seems little chance that distances can be extended very far inland, because the duct gets backed up against the coastal mountains.

Table - Notable Hawaii to Mainland North America Contacts on 144 MHz through 5.7 GHz via tropospheric Ducting

First Contact			Current Distance Record		
MHz	Date	Stations	Date	Stations	Km
144	1957 July 8	KH6UK-W6NLZ	1995 July 1	KH6HME-W7FI	4,333
222	1959 June 22	KH6UK-W6NLZ	1989 July 15	KH6HME-XE2/N6XQ	4,142
432	1979 July 18	KH6HME-WB6NMT	1989 July 15	KH6HME-XE2/N6XQ	4,142
903	1993 Aug 23	KH6HME-N6CA	1994 July 13	KH6HME-N6XQ	4,061
1296	1984 June 24	KH6HME-N6CA	1989 July 15	KH6HME-XE2/N6XQ	4,142
2304	1994 July 11	KH6HME-N6CA	1994 July 14	KH6HME-N6CA	3,973
3456	1991 July 28	KH6HME-N6CA	1991 July 28	KH6HME-N6CA	3,973
5760	1991 July 29	KH6HME-N6CA	1991 July 29	KH6HME-N6CA	3,973

What Else?

Paul is best known for his trans-Pacific VHF through microwave operating, but has other interests. For many years, Paul got on 40 meters for regular contacts with friends back in California and for chatting among the islands. He is also the second recorded member of the Hawaii QRP Club. Paul often gets on 50 MHz from his home station, which is closer to sea level, and has provided countless six-meter operators with their 49th or 50th state. His 50.061 MHz beacon has been heard around the world.

There are the further challenges on the trans-Pacific path. Paul has equipment for 10 GHz and turns on the 10 GHz beacon when he is on Mauna Loa, hoping that someone on the mainland will hear. So far, no one has, but that seems to be only a matter of time. Distances on some of the higher bands will certainly be extended as a natural consequence of greater activity. Perhaps Paul can interest some Mexican stations or someone will make an optimally timed trip to the Mexican coast just for the fun of making a 5,000 km trans -Pacific contact.

More importantly, Paul has motivated a whole generation of VHF and UHF experimenters. Operators throughout the US, Europe, Australia, and other places have sought to emulate and even exceed Paul's accomplishments. His pioneering work has inspired the current offer of the Brendan Cups for the first transatlantic contact on 144 MHz. If nothing else, Paul has given countless hams a great thrill of

KH6HME Paul Lieb

That tower on Mauna Loa

Pics courtesy of KH6HME website

working across the Pacific, because he has been willing to spend a day or two on a lonely mountain just for the fun of giving out contacts and spending time chatting with each new operator he worked. Many have thrilled to hear Paul's "Aloha from Hawaii" spanning the Pacific on VHF.

For more information and additional photographs from the KH6HME station on Mauna Loa, point your web browser to www.hiloweb.com/kh6hme. If you want to read more about the possibilities of long-distance VHF and UHF ducting, see my article in March 1996 *QST*, "*Transoceanic Ducting at VHF and Above*." ... **W3EP.**

Africa and the Indian Ocean

Eric Van Offelen, who operates as EL2VO during his periodic business trips to Liberia, logged 130 contacts on six metres from February 13 to April 1, including 10 European, 2 North African, and 2 South American countries.

Several other unusual African and Indian Ocean stations were active during April. 5U7DG (Niger) worked Spain, Greece, and perhaps other countries in southern Europe, and provided SV1DH with country number 163. From the Indian Ocean, 3B9R (Rodriguez Island) worked into Europe as far north as Belgium and Germany during the first week of the month.

Japanese stations in several call areas also found 3B9R on at least two days. Okinawans (JR6) logged 8Q7QQ (Maldives) on April 18 and 4S7SE (Sri Lanka) worked Japan on the 5th.

Europe and the Eastern Mediterranean

Southern Europeans continued to work into Africa on many days in April, but the more interesting contacts came from stations in the eastern Mediterranean. Israelis 4Z5JA and 4X1IF, along with 5B4AGN (Cyprus), worked Argentina and Brazil early in the month. 5B4AGN also worked JR6BU on April 3, for the first Cyprus-Japan contacts of the current cycle.

The Pacific

East-west paths across the Pacific continued to open during April. In addition to A35RK and 3D2TC, H40OO (Temotu) created a good deal of excitement on April 19, when he worked JA call areas 1 through 6. BV2DP (Taiwan) logged an impressive list of stations on 6 metres during April, including YB0ARA/9, P29PL, A61AH, T88WX, VQ9CV, 9M2NK, and KH0XX.

Microwaves

Brian Justin, WA1ZMS, claimed a new 75 GHz North American distance record of 34 km for a contact made with K2AD on April 5 in Virginia. The pair generated a few milliwatts from a transmitter chain built with the help of University of Virginia grad students. They began with 12 GHz California Microwave phase-locked loop oscillators, tripled to 37 GHz, and then doubled with GaAs diode mixers. Antennas were 1-foot dishes.

The CW signals were just in and out of the noise. Brian calculated the total oxygen and water vapour absorption at about 0.24 dB per kilometre, or about 8 dB for the entire path. A drier day could have reduced atmospheric losses by a few dB, but Brian soon hopes to improve total system performance with a better receive system and try again. The listed world record is well over 100 km, made in 1995 by a Swiss and German team. ... Thanks to **Emil W3EP** and *QST.*

King Island

Rob VK3EK/DEM operated on 144 MHz from King Island in Bass Strait from 29/4 to 3/5. He used 160 watts to Bob Jordan's 10 element Yagi and worked the following: VK3ATQ 5x2, VK3TMP 5x2, VK3AUU 5x2, VK3KAI 5x1, VK3XLD 5x1, VK3XRS/p 5x1, VK3CAT 5x1, VK3BJM 5x1, VK3CY 4x1, VK3ZKH 5x1, VK3DUT 5x1, VK3AFW 5x2, VK3BRZ 5x3, VK3ZLS 4x1, VK5NC 5x2.

Propagation to the NE and SE was very poor. Tried to work VK3BWT at Mallacoota, but no luck or anyone from the north. Better time of the year and some propagation needed. In all, 15 stations worked in the time I had, which was really a golfing trip until a radio (IC706 and linear) was planted in my wife Maxine's bag. The crayfish was good though!

New Zealand

Mike ZL3TIC reported reasonable band conditions in ZL as follows:

20/05/99

0200 46.240 VK video 5x9+
0420 VK2GJH 50.160 5x7
0430 VK2FHN 50.110 5x3
0500 49.750 5x1, lots of offsets

21/05/99

0300 46.170 VK video 5x9
0430 46.240 VK video 5x9 in up to 0930
2300 46.170 and 46.240 5x9 on backscatter beaming US!

22/05/99

0000 46.170 and 46.240 direct path
0056 VK4WQ 50.140 5x1
0102 VK4KK 50.150 5x7
0105 VK4BLK 50.150 5x3
0110 VK4PU 50.150 5x8
0130 XE1KK/b 5x1 with QSB in for half an hour
0230 VK2DN heard 5x9
0100 to 0400 49.750 in the main, offsets were: 49.7478, 49.7500 and 49.7460 0515 46.170 still 5x9+

Steve VK3SIX reports a little winter Es and F2

20/5/99

ZL3SIX beacon from 0400 to 0800. ZL3NE/?1 and ZL2AGI worked. 48.250 +/- offsets from 300 degrees S/E Asia in from 0600 to after 0800.

21/5/99

VK4BRG/b VK4RGG/b and VK4s on Es.

22/5/99

0600 to 1000 49.7469/7479/7500/7502 in for a long time.

VK2GJH reports he will operate as C21JH from 4/7 for two weeks.

Guy Fletcher VK2KU
<guy@ics.mq.edu.au> reports:

GUIDELINES for the GRIDSQUARE LEAGUE TABLE

1. Submit number of grid squares claimed as worked on 144, 432, and 1296 MHz. No details of actual squares/stations required.
2. Starting date for contacts: 1st January 1990 (as for WIA Awards).
3. No distinction between modes (CW, SSB, FM etc.) - a square is a square.
4. EME claims to be listed separately.
5. Contacts via repeater or active satellite should not be counted.
6. Cross-band contacts should not be counted (on either band).
7. Except as allowed by Rule 8, all squares claimed must be worked from locations within a single limited "region", within a circle of radius 50 km.
8. A gridsquare may also be claimed by a "reverse contact" from that square to any station in your home square.
9. Entry is open to any VK, not just subscribers to the VK-VHF Reflector.
10. The Table of Standings will be posted on the VK-VHF Reflector roughly every 3 months, and may be reprinted from there in *Amateur Radio* and *Radio and Communications* magazines.
11. Updates to me at any time by email/mail (QTHR 1999).

Comments

If you move house to a new "region", you have to start again, though your old score still stands of course.

Continued on page 38

Continued from page 37

The intention of Rules 7 and 8 is to encourage portable operation (up to 100 km from home, or from a rare gridsquare) to overcome the limitations of a home QTH, but not to an extent which confers an unreasonable advantage. If you regularly go portable to a different "region", you can keep a separate tally for the /p operation.

There is no minimum number of squares to start - you don't need to have 50 squares on 2m! Please enter at any level so that we may all enjoy watching the growth of your tally.

No correspondence will be entered into by myself regarding the veracity of people's claims. If you want more details from someone, please email them privately and not through the Reflector. Dire punishment for transgressors!

Year 2000 Expedition

Neville VK2QF sends a little more on his plans for a Year 2000 DXpedition. He says: *Thanks go to all for the interest and wide ranging support with constructive comment by email.*

As there is a clear preference for Nauru I am looking at that option and with help from seasoned Dx'er Jack VK2GJH perhaps an operation maybe worthwhile given his operations there and probably one or two local C21s soon! More later.

Ron Cook VK3AFW advises: *Good news for those who missed out on last years fantastic meteor scatter contacts during the Leonids. The following is from the current posting of "Spacenews".*

Leonids No Big Worry: *The heavy storm of Leonid meteors expected in November 1999 should not be a major concern for satellite operators, experts said at a conference last month. While the peak of the storm is forecast to be up to four times the rate of the 1998 storm, it will still be far below the extremely heavy rates seen in the last Leonids storm in 1966. The 33-year cycle of heavy Leonids storms had caused concern that satellites could be damaged by the flux of small meteors, but no satellites were damaged in the 1998 storm.*

Four times the peak of 1998? I've got to see that!

Ted Collins G4UPS reports that **Romy VU2GTE** (India) appeared on 28.885 MHz SSB several times during April and reported that he would look into applying for a six-metre permit. He could receive on six metres. Also, **Sergio AP2WAP** (Pakistan) was calling the six-metre net on 28.885 on 16/4 at 0826 using SSB and 5x7. May be two new countries for VK?

Apart from his sked contacts with G3CCH and SM7AED, Ted reports few contacts on six metres for April. On 29/4 he worked IK8DYD 5x9 and heard the 7Q7SIX beacon 559.

Listener's Log

David Vitek's log for 27/4 to 28/5 indicates a considerable falling off in the reception of VHF signals. Much of his time was spent on 10 metres where even there conditions were not always favourable.

Two of his best days were 13/5 and 21/5.

On 13/5 he logged by Es between 1050 and 1253: RTQ0 51.67A, ABMN0 51.74A, ABSQ2 62.760, STQ2, ABCN1,NEN0, and ZLTV on 45.23960 and 45.2640 5x3. The MUF went higher - at 1127 4SBS Brisbane 93.3 MHz, ABCFM Nambour 88.7, then VK4ABP/b 539. The K Index was 5.

On 21/5: From 0400 to 0708 - ABMN0 51.740A, RTQ0, ABCN1, ZLTV 45.260 etc 5x4; 52 MHz: VK2RSY/b, VK2RHV/b; 50 MHz VK4WTN, VK4BLK; 48.250 0605 5x5, 9MTV 48.23960 5x6. So it seems something is usually to be found.

Closure

The next few weeks may see the usual winter Es for 50 MHz, but the current weather pattern across the southern areas is not conducive to ducting across The Bight to enhance conditions for the higher bands - the highs are situated too far from the ocean. Ah well! There will be good times again one day!

Closing with two thoughts for the month:

1. If it weren't for the last minute, a lot of things wouldn't get done, and
2. A real friend is someone who takes a winter holiday on a sun-drenched beach and doesn't send a card.

73 from The Voice by the Lake.

BT

http://www.wia.org.au

check out the WIA webpage today!

SILENT KEY

It is with sadness that I advise of the death of long time member Mr Lyell Woolnough, VK2GW, late of Gordon, at the age of 93. He passed away in Hornsby Hospital on 27th May 1999 after a short illness.

Born 10th March 1906, the son of a professor of Geology, his interest in radio started when accompanying his father on an expedition into Central Australia in 1922.

In order to keep nightly skeds with VIA Adelaide Radio an army communications unit under Lieutenant Bowen was included. Two trucks containing a spark transmitter, receiver and generator were used to convey the equipment.

Lyell was tutored by Lieutenant Bowen and obtained his certificate in 1923 at the age of 17.

After graduating in mechanical and electrical engineering he first worked in the electrical branch of the Railways. On retirement he held the position of Superintendent of the then White Bay power station.

During the 1950's he held various honorary positions with the WIA including that of vice president.

Most of his equipment was home brew or modified disposal types. He favoured CW and gained several awards.

Last year he was awarded a certificate commemorating 75 years as a WIA member.

In recent years although maintaining his interest he was content to tune the bands and reflect on his past achievements.

Submitted by Dudley Reynolds VK2ANW

The WIA regrets to announce the recent passing of:-

G M PERCIVAL VK1GM

L M LE BRETON VK2AKT

D HUNZIKER VK2BHD

W L WOOLNOUGH VK2GW

J KRAMREITER VK3DCJ

J K COSGRIFF VK3WM

(Ivor) Stafford VK3XB

On VIDEO

WIA Federal Videotape Library

Don Bland VK4TVD
WIA Video Coordinator:
16 Concorde St., Oxford Park, QLD 4053

Now every radio club can provide its members with quality technical lectures on subjects covering the whole range of Amateur Radio activities by taking advantage of the WIA Federal Videotape Library. You'll find this a boon particularly if yours is a country club that often has difficulty obtaining a variety of expert lecturers for its regular meetings. (Individual Amateurs and Librarians should take note of the duplication fees at the end of this article.)

For radio clubs affiliated with the WIA it's inexpensive and easy. Here's how it works. For those titles that the WIA has placed in the public domain, all you have to do is supply the WIA Video Coordinator with...

- a list of requested titles,
- a blank video cassette,
- a "VCR" Postpak,
- and enclose your address and stamps for return postage.

The program is then free for your use in the support of amateur radio in your area, including duplication and transmission over Amateur Television if you wish. Those programs that are copyright are indicated by the © symbol and are available only ON LOAN. To obtain any Loan Item supply the WIA Video Coordinator (address below) with...

- your requested title,
- information about your preferred VCR format,
- enclose your address and stamps for postage to you,
- and a statement signed by a responsible member of your club that "I undertake that while (program title) is assigned to me, I will not allow it to be copied or transmitted by any means whatsoever, and that I will return the same promptly after showing".

Note: the WIA does not hold a licence from the copyright owners of certain titles; therefore no loan or copy service is available for those so marked; they are held for WIA Archive purposes only.

The present "preferred VCR format" is Standard Play VHS. For estimation of postage, a 3 hour VHS cassette measures 200x100x30 mm and weighs 350 gm.

New Air-Mail Postal Regulations. To avoid disappointment by lack of arrival of late-minute requests, this important change in Postal Regulations should be allowed for by Club Activity Organisers. All packages sent by Airmail MUST now carry a declaration sticker certifying that the contents are not dangerous or prohibited. For items weighing less than 500 gm (i.e one VHS cassette) pink stickers are obtainable from any Post Office. Items weighing more than 500 gm can only be posted at an official Australia Post Office and a complete declaration of contents must be made. Any item not carrying the correct sticker will not be transported by air, regardless of whether the correct value of stamps for Air Mail have been affixed.

A note to individual amateurs. From the inception of the WIA Federal Video Service cassettes were freely available to all comers. However, in order to stem the rising tide of requests for copies of programs from individual amateurs (some of whom asked for over 10 hours of programs at a time) there is now a duplication fee (payable in advance) of $2 per hour or part thereof to individuals. Isolated or disadvantaged individual amateurs will however continue to receive free concession.

A note to librarians. A number of educational institutions have already availed themselves of the WIA technical lecture tapes. A duplication fee of $10 per hour or part thereof is payable in advance by all institutions not affiliated to the WIA.

A note regarding cassette quality. The WIA Videotape Coordinator reserves the right to refuse to copy onto inferior quality video tape. Video dubbing is a real-time, one-at-a-time operation and in the past low quality tape has been the cause of many lost hours due to clogged heads, etc. Libel laws prevent publication of a list of manufacturers of suspect tape, however, most of the well known brand names are acceptable; in particular use only those tapes bearing the official "VHS" logo.

Finally a note to all radio clubs. No new titles have been added to the library during the last 12 months. Has your club video taped any interesting lectures that would be of interest to other amateurs? If so, please contact me at the address below so that I can arrange for a suitable copy to add to the library.

For up to date titles and information visit the WIA Website - http://www.wia.org.au/

WIA Videotape Program Title Listing

Notes:

"©" = Copyright; no copy service

"*" = Optically converted to PAL from NTSC by WB2LLB; noticeable flicker

"w" = available ONLY to Radio Clubs Affiliated with the WIA as per agreement with OTC

"o" = program now out of date

Standard Format: "VHS" Standard Play

Entries are given as Title - Description - Note

Amateur Radio - Historic Interest

Wireless Telegraphy (circa 1910, 10 min.) Archive material courtesy David Wardlaw VK3ADW ©

Amateur Radio - TV Pilot (1968, 30 min.) Archive material courtesy TEN channel 10 ©

Opening of Burley Griffen Building (1977, 45 min.) Archive material

ATV in Australia - made for British ATV Club (1978, 30 min.) Archive material

ATV in United Kingdom - reply from BATC (1978, 30 min.) Archive material

ATV in Australia 1980/81 - made for BATC (1980, 60 min.) Clips from ATV Groups in VKs 2,3,4,5 & 7

History of ATV in South Australia (1980, 30 min.) Archive material, still building

ATV in United Kingdom 1978/81 (1981, 30 min.) Remake of their previous effort

Continued on page 40

Continued from page 39

CQ ATV DX International (1983 , 60 min.) ATV in USA and Europe o*

High Definition TV Tutorial (1983, 60 min.) A look at what is to come in Broadcast TV

ATV Hamfest, York Pennsylvania (Sept. '83, 6 hrs.) Various ATV technical lectures from USA

Opening of Amateur Radio House - NSW HQ (1983, 102 min.) Archive material

ATV in Victoria (1984, 54 min.) Courtesy of "The Roadshow Gang"

Keynote speeches by Fed Pres. David Wardlaw & State DOC Manager John Milton (1985, 135 min.) From WIA 75th Anniversary Seminar

Heard Island DXpedition (1986, 60 min.) Raw Unedited; from 1986 VK2 Seminar

Amateur Radio - Promotional

The Ham's Wide World (1969, 27 min.) Superseded by "The World of Amateur Radio" o

This is Amateur Radio (1970, 15 min.) Pitched at teenagers

Moving Up to Amateur Radio (1975, 11 min.) Pitched at CBers

7J1RL DXpedition (1976, 60 min.) General Amateur Radio interest; LOAN ONLY ©

This Week has 7 Days looks into Amateur Radio (1978, 25 min.) Pitched at teens; includes some ARRL footage.

The World of Amateur Radio (1978, 26 min.) Superseded by The New World of Amateur Radio o

Amateur Radio - The National Resource of Every Nation (1979, 6 min.) Encapsulates AR; good for public exhibitions

Amateur Radio - The National Resource of Every Nation (1979, 60 min.) Continuously running version available ON LOAN

The New World of Amateur Radio (1988, 28 min.) Supersedes The World of Amateur Radio

Antennas

G6CJ's Aerial Circus (1977, 90 min.) The Definitive Antenna Lecture; LOAN ONLY ©

Wire Antennas (1978, 40 min.) Antennas for HF and Antenna Tuners

Loaded Wire Antennas (1980, 50 min.) Using Inductive and Capacity loaded Antennas

Antennas and Directivity (1985, 73 min.) Lecture given to a group of Radio Amateurs w

Antenna Rotator Systems (1986, 50 min.) Servicing the several different types

Broadband Antennas (1986, 62 min.) Includes terminated antennas

Amateur Television - Activity

ATV Item from UK (via Doug VK6ER, 1984) Unedited clips

Hello from America! Made for British ATV Club (1988, 100 min.) Clips from ATV Groups in the USA

VK5 ATV Call-in (1990) Made for VK4XRL who had recently visited

Amateur Television - General Interest

Low Definition Television (1983, 25 min.) Re-creation of TV as transmitted by Baird.

Model Aeronautical Mobile ATV (1983, 6 min.) ATV camera & TX mounted in a model aeroplane.

VK5RCN - Australia's first wind powered ATV repeater (1983, 61 min.) Tour of VK5RCN by Barry Bryant (silent key).

Australian TV History - The Untold Story (1988, 56 min.) Lecture to Radio Amateurs Old Timers Club.

Australian TV History - Part 2 (1988, 49 min.) Technical slides not used in the above.

The Development of the TV Test Card (1988, 43 min.) Made for BATC by the BBC Training Dept.

TV for Amateurs (1990, 19 min.) Excellent introduction to ATV

The first nation-wide ATV AUSSAT TV (1990, 2 hrs.) Noisy off-satellite but interesting.

Amateur Television - Technical

The Signal to Noise Story (1982, 45 min.) Superseded by UHF Preamplifiers (below). o

UHF Preamplifiers (1983, 45 min.) Explanation and demo. of low noise preamps.

Getting Started in Amateur Television (1983, 55 min.) How to set up an ATV station

Testing ATV Transmitters (1983, 50 min.) How to correctly measure ATV systems

Computers

Demo. of VK5RTVs Micro-Computer Controller #1 (1979, 10 min.) First µ-Computer controlled repeater in VK.

Understanding Micro-Processors (1980, 60 min.) A somewhat dated technical description. o

An ATV Ham shack Micro-Computer (1981, 10 min.) Describes now unavailable microcomputer kit. o

Getting Started in Amateur Micro-Computers (1983, 33 min.) Demo of hard & software for Amateur Radio.

Data Transmission

Getting Started in Amateur RTTY (1983, 85 min.) RTTY using teleprinters and Micro-Computers.

Amateur Packet Radio (1984, 60 min.) Theory and Demonstration.

Packet Radio Lecture by Jim Swetlikoe (1984) From WIA Seminar

Packet Radio - 10 months on (1985, 65 min.) Raw unedited; from 75th anniversary. VK2 Seminar.

X25 Protocols and Packet Switching (1986, 47 min.) Lecture given to a group of Radio Amateurs. w

Amateur Satellites and Packet Radio (1989, 130 min.)

Microwave Techniques

Introducing Microwaves (1988, 74 min.) Des Clift gives a "Nuts & Bolts" expert technical lecture

Propagation

Getting Started in Understanding the Ionosphere (1983, 50 min.) How the Ionosphere aids HF communication

Moonbounce EME lecture by Lyle Patison (1984) From WIA Seminar

VHF Signal Enhancement by Aircraft (1986, 70 min.) Raw Unedited; from 1986 VK2 Seminar

HF DX Seminar with Iris & Lloyd Colvin (1990, 74 min.)

Satellites

Getting Started in Amateur Satellites (1983, 60 min.) Superseded - see below o

An Introduction to Amateur Satellites, Pt 1 (1984, 60 min.) An overview of Amateur Satellite working o

Micro-Computer Aids to Satellite Tracking, Pt 2 (1984, 30 min.) Programs for tracking & decoding telemetry o

Using Phase III Amateur Satellites (1984, 90 min.) History, construction & use of high orbit satellites.

The Amsat Oscar Phase 3 Story (1985, 80 min.) Dr. Kari Meinzer "The Father of Oscar" includes film of launch.

Antennas for Satellites (1986, 75 min.) Raw Unedited; from Dr Trevor Bird's 1986 VK2 Seminar

Amateur Satellite Service - What it has to offer (1989, 190 min.)

Amsat Ground Control - What is involved (1989, 130 min.)

Space - General Interest

Apollo 13 Disaster (1980, 90 min.) Australian tracking procedure saved Apollo 13

SSTV Pictures from Space - Voyager (1983, 15 min.) SSTV pix converted from Saturn fly past o

AUSSAT - Australia's Domestic Communications Satellite (1984, 62 min.) Technical description of services offered

Amateur Radio's Newest Frontier (1985, 26 min.) Amateur Radio in Space; General PR.

Working W5LFL in orbit from VK1ORR (1986, 23 min.) Raw Unedited actuality footage

Miscellaneous

An Auxiliary Battery Charger (1981, 30 min.) Charging a second mobile battery

Lecture - Winning Foxhunts (1981, 45 min.) How to do it from one who has!

Getting Started in Amateur Construction (1983, 50 min.) Mechanical hints for novice constructors

The Communications Consequences of Nuclear War (1983, 60 min.) Why your gear may not survive even if you do!

The Far Eastern Broadcasting Company (1984, 60 min.) How a Short Wave Broadcaster operates

The Australian "Over the Horizon Radar" (1984, 60 min.) How the "Australian Woodpecker" works

What to Expect when the RI Calls! (1984, 34 min.) by Geoff Caner - a Dept of Communications Field Officer

A Future Shock - Lecture by Roger Harrison (1984) From WIA Seminar

Radio Comm. Act - Lecture by Colin Oliver (1984) From WIA Seminar

Doppler Direction Finding for Foxhunters (1985, 43 min.) Raw unedited; from 75th anniversary VK2 Seminar

Fitting BNC Connectors (1985, 7 min.) Correct Assembly of Crimp type BNC plugs w

Handling Static Sensitive PCBs (1986, 6 min.) Improving reliability of Printed Circuits. w

Extra License Grades (1986, 70 min.) Raw Unedited; from 1986 VK2 Seminar

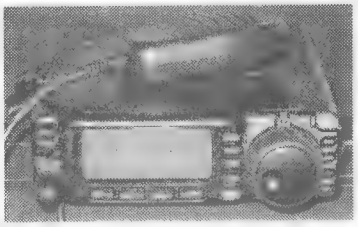
Thick Film Modules (1988, 45 min.) Description of modules available from VK5 WIA

Quartz Crystals (1988, 106 min.) Clem Tilbrook gives a "Nuts & Bolts" expert technical lecture

How to survive in a Dog Pile (1989, 148 min.)

Making friends on DX (1990, 28 min.)

ET



Radio and
Communications
Incorporating AMATEUR RADIO ACTION and CB ACTION

Edited by
Chris Edmondson, VK3CE/4
PO Box 123,
Eagle Heights,
Queensland 4271
ph (07) 5545 0666
fax (07) 5545 0622

Well, here's something a lot of people have waited quite a while to see. It is, of course, the exciting all-new Yaesu FT-100 multi-mode multi-band transceiver. It covers all bands from 160 metres to 70cm, with 300+ memories, and offers DSP as standard. Read all about it! And read about the *History of Radio* too.

July's R&C packs a few surprises and loads of great amateur radio columns and stories. Like these...

- 1999 DAYTON HAMVENTION REPORT: Our man was there with his trusty camera. What a place!
- A RETIRED RI LOOKS BACK... Could these stories be real? Read this lot and decide for yourself...
- THE HISTORY OF RADIO. A truly fascinating multi-part series which puts it in chronological order.
- BUILD THE MOXON RECTANGLE. Les Moxon, G6XN has another design, and VK3BCY describes it.
- REVIEW: YAESU FT-100 'FIELD COMMANDER'. There's not much this radio doesn't do! So is it small?
- *As usual, we have our DX columns, mods and lots more... the best stories and regulars every month!*

Don't miss out — **RADIO and COMMUNICATIONS** is great reading for amateurs!

Check your local newsagent today!

(PS. We also have the biggest collection of radio-oriented Classified adverts in the country. There's lots of them because they *work* so well. Ask your newsagent to keep a copy for you each month. Hurry — you might *miss* something!)

vk3ce

AMSAT AUSTRALIA

Bill Magnusson VK3JT
RMB 1627 Milawa Vic. 3678
Email: vk3jt@amsat.org

National coordinator:
Graham Ratcliff VK5AGR
Email: vk5agr@amsat.org

AMSAT Australia net:

The AMSAT-Australia net is held on 80 or 40 metres LSB (Lower Side Band) each Sunday evening (except over the Christmas/New Year period). During the winter months in South Australia (end of March until the end of October) the net is on 3.685 MHz +/- QRM with an official start time 1000utc with early check-ins at 0945utc. During the summer months when daylight saving is in operation in South Australia (end of October until end of March) the net is on 7.068 MHz +/- QRM with an official start time of 0900utc with early check-ins at 0845utc. The times and frequencies have been chosen as the best compromise for an Australia-wide net taking into consideration seasonal propagation changes and the various state summer time variations.

AMSAT Australia newsletter and software service:

The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIRMAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Keplerian Elements.

Current keps are available from the Internet by accessing the AMSAT FTP site, ftp.amsat.org and following the sub-directories to "KEPS".

Good News for High Speed Downloads

The imaging capabilities of UoSat Oscar-36 are truly remarkable. Pictures have been published recently from the high-resolution camera. They show ground detail previously thought unattainable in such a satellite. The 10-metre resolution camera clearly shows up streets and individual properties. As if that's not enough, the images are multi-spectral. Such images can be overlaid showing up differences between types of vegetation and even soil type variations. Prior to UO-36 this sort of performance was strictly in the realm of the sophisticated commercial imaging satellites.

Of course there's a price to pay for this performance. The image files are large to say the least. At 'normal' baud rates the download times from the satellite would be excessive. UO-36 has transmitters capable of 38.4k and much higher baud rates. The catch is that the receiving apparatus needed to accommodate the greater bandwidths involved has up to now, been difficult to construct. News is to hand of a simple circuit board addition to one of the usual amateur transceivers that allows it to be used to achieve this happy state of affairs. The modem will need a small work-over too but this is simple by comparison. I hope to be able to report more on this development next month. Listen in to the Amsat net on Sunday nights for the latest news on this exciting project. In the meantime the controllers at Surrey University are bringing the high-speed downlinks on line. Speeds of up to one megabaud are available on UO-36 and may become commonplace in the future.

Six-monthly Amateur Radio Satellite Update

Here is a short-form list showing the current status of the operational amateur radio satellites. For a complete listing showing all transponder modes and frequencies for all amateur radio satellites, past or present, operational or defunct, visit the AMSAT World Wide Web site. The complete list is far too exhaustive to print here.

RS-13

Uplink 21.260 MHz to 21.300 MHz CW/SSB
Uplink 145.960 MHz to 146.000 MHz CW/SSB
Downlink 29.460 MHz to 29.500 MHz CW/SSB
Downlink 145.960 to 146.000 MHz CW/SSB
Beacon 29.504 MHz

Last reported in mode K, the RS-12/13 satellite has seen many recent changes in operation. Modes K, T, KT and simultaneous RS-13 operation have all been reported. No mode-switching schedule has been forthcoming from the controllers. I have had no recent reports of RS-12 being in operation.

RS-15

Uplink 145.858 to 145.898 MHz CW/SSB
Downlink 29.354 to 29.394 MHz CW/SSB
Beacon 29.352 MHz (intermittent)

Semi-operational, mode A, using a 2-meter uplink and a 10-meter downlink.

AO-10

Uplink 435.030 to 435.180 MHz CW/LSB
Downlink 145.975 to 145.825 MHz CW/USB
Beacon 145.810 MHz (unmodulated carrier)

Operational but no longer under ground station control. AO-10 is locked into 70-cm uplink and 2-meter downlink (mode B) operation. Within these constraints AO-10 continues to function well but is subject to periodic deep QSB. This can be partially eliminated by switching antenna polarisation. Strong signals have been heard even at apogee. I have checked AO-10 around apogee and found the transponder to be quite useful. Good return signals with 20 watts uplink power. You have to play with the antenna polarisation to get best results. When closer in around perigee, the signal throughput is every bit as good as it was in the early days of AO-10 operation. Well worth a look at present.

AO-27

Uplink 145.850 MHz FM
Downlink 436.792 MHz FM
Operational, mode J.

Still listed as operational. Please let me know if you hear anything from this satellite. I have had no reports of it being heard in our area.

FO-20

Uplink 145.900 to 146.00 MHz CW/LSB
Downlink 435.80 to 435.90 MHz CW/USB
Operational. FO-20 is in mode JA continuously.

FO-29

Voice/CW Mode JA
Uplink 145.900 to 146.00 MHz CW/LSB
Downlink 435.80 to 435.90 MHz CW/USB
Digital Mode JD
Uplink 145.850 145.870 145.910 MHz FM
Downlink 435.910 MHz FM 9600 baud BPSK
JAS-1 appears to be in mode JA (voice mode) continuously. No further news on mode switching difficulties.

KO-25

Uplink 145.980 MHz FM 9600 Baud FSK
Downlink 436.50 MHz FM
Operational. This satellite is carrying the major part of the digital traffic load since KO-23 went silent in January 1999.

UO-22

Uplink 145.900 or 145.975 MHz FM 9600 Baud FSK
Downlink 435.120 MHz FM
Operational. Carrying the packet radio satgate load as well as lots of day to day personal traffic.

UO-11

Downlink 145.825 MHz FM, 1200 Baud AFSK
Beacon 2401.500 MHz
Operational. The mode-S beacon is on, transmitting an unmodulated carrier. Telemetry indicates that it is only delivering half power. This beacon is a useful test source for those testing mode-S converters prior to the launch of P3D. The 435.025 MHz beacon has been off for some time.

AO-16

Uplink 145.90/145.92/145.94/145.86 MHz FM 1200 bps Manchester FSK
Downlink 437.0513 MHz SSB, 1200 bps RC-BPSK 1200 Baud PSK
Beacon 2401.1428 MHz
Operating normally. Has anyone heard this beacon? I occasionally get requests for information on weak signal sources for checking mode S equipment. I have had no reports of the 2401 MHz beacon being heard in VK/ZL.

LO-19

Uplink 145.84/145.86/145.88/145.90 MHz FM 1200 bps Manchester FSK
Downlink 437.125 MHz SSB 1200 bps RC-BPSK
Currently semi-operational. Downlink and telemetry only.

IO-26

Uplink 145.875/145.900/145.925/145.950 MHz FM 1200 Baud PSK
Downlink 435.822 MHz SSB
Semi-operational. Telemetry downlink only.

TO-31

Uplink 145.925 MHz 9600 baud FSK
Downlink 436.925 MHz 9600 baud FSK
Operational and very active with mainly digital image files being uploaded almost daily.

GO-32

Downlink 435.325/435.225 MHz
Undergoing commissioning. The satellite is transmitting HDLC telemetry framed so a TNC in KISS mode will decode it. There is no continuous beacon. A 9600-baud burst is transmitted every 30 seconds for a continuous 3 seconds in length, currently on 435.225 MHz. Telemetry display software is available from the internet. Still no word on when this satellite will assume full operations.

UO-36

Uplink and downlink frequencies have not yet been established.
The satellite is not currently available for general uplink transmissions. UO-36 has been transmitting 9600-baud FSK telemetry framed in a VLSI format using a downlink frequency of 437.400 MHz. Commissioning of the high speed downlinks is continuing and spectacular pictures are being received in Europe by suitably equipped stations which have a shared footprint with Surrey University.

The Following Satellites Are Non-operational At This Time:

KO-23

KO-23 went silent in January this year. The last packets I received were on 17th January. Control stations report damage to one of the batteries. It is occasionally heard in test mode with a strong carrier and idling modulation.

RS-16

No good news at all. All attempts to revive this satellite have failed. The 435 MHz beacon is still reported as operational.

DO-17

No news. It appears that no further attempts have been made to get DO-17 back.

WO-18

Downlink 437.104 MHz SSB 1200 Baud PSK AX.25
No further news on status or rescue attempts.

ICOM Clearly Ahead

"VK3LZ calling!"

More sound information from your friends at Icom.

ICOM BOOSTS DEFENCE COMMUNICATIONS FOR US ARMY

Every amateur radio enthusiast knows Icom's reputation for quality and durability. Well, just to confirm that reputation, comes the news that Icom has won a significant defence contract for the U.S.Army. For the first time since WWII, they have chosen a non-American supplier for hand held radio equipment for the US Defence Forces. 22,000 Icom IC-F3S units are now in service as part of a special forces communications system known as the 'Soldier Intercom'. Testing was conducted against leading American radios, but for performance, durability, and ease of use the Icom units won the battle convincingly. It's reassuring to know that the Icom amateur equipment you buy is built to the same high quality as radios used by soldiers in the field.

HAMFESTS PROVING MORE POPULAR THAN EVER.

Closer to home, we've noticed significant attendance increases at the various Hamfests around the country. If you have never been to one, or haven't attended one in recent years, be sure to get along soon. They are a great way to meet fellow radio enthusiasts and check out all the latest gear. Look out for your friends from Icom while you're there.

DATES TO REMEMBER

Wagga Wagga Hamfest August 7 and 8
Shepparton Hamfest September 12

"...73"

FreeCall 1800 338 915
290 -294 Albert Street
Brunswick, Victoria 3056
Tel : (03) 9387 0666
Fax : (03) 9387 0022
www.icom.net.au
ACN 006 092 575

LL Brown Adv 7235

REPEATER LINK

Will McGhie VK6UU
21 Waterloo Cr Lesmurdie 6076
VK6UU@VK6BBR
will2@omen.net.au
(08) 9291 7165

Change of E-mail

After a number of problems with my ISP (Internet Service Provider) I have moved my Internet account, and as a consequence my E-mail address has changed to that given above.

We should do something

I started this column 10 years ago in the hope that it would, among other things, provide a focus for voice repeater managers and builders to improve regulations that are applied to this aspect of our hobby.

I have mixed feelings about any success that I have been able to achieve. Perhaps few believe the regulations that apply to voice repeaters need any changes.

However I have received feedback over the years supporting my opinion that fundamental changes are needed. Discussion from time to time with users of voice repeaters shows a general lack of understanding by some amateurs, of the many regulations that limit voice repeater experimentation. Comments like "Why don't we do such and such?" receive a response; "Because the existing regulations don't allow it." This is then often followed by "We should do something about it." Therein lies the problem; who are we?

The assumption that someone or some group are busy working away at changing voice regulation changes, on the assumption that they need changing, is a fallacy. The infrastructure exists to some degree via the WIA but the WIA needs input. Not just, "We want to be able to do such and such", but a detailed submission that the WIA can use as an argument in order to bring about change. I'm talking about a fundamental change, not just being allowed to link 4 rather than 3 repeaters, but prove that such restrictions should not exist in the first place.Organised representation.

What I'm pressing for is a better stronger representation for voice repeater builders and managers. If we want a stronger voice we need to become organised. At the moment what little effort is being expended is fragmented and very much on a State by State basis. One State is allowed to do something that may be denied in another State.

First I have to find out whether there is sufficient interest to expand this part of our hobby. Do we want as few regulations as possible? Do we want general concept regulations rather than detailed nit picking regulations? If we do want a fundamental change in the approach that is applied to voice repeater regulation, then we have to do the work, and most important become organised.

What does it mean to become organised? I believe that we first need to find out who we are and how many we are. We can, via Packet Radio and E-mail, gather together a list of interested voice repeater builders and managers. Once we are communicating effectively together we will have strength of numbers and a variety of ideas that we can then pursue.

One of the best ways to be in touch is via a News group on the Internet. This allows all to participate and for all to see what is being said. Packet radio and other input can be fed into the Internet news group as well.

Step One

Step one is to gauge interest, so in an effort to do just that I look for your thoughts. Contact me via e-mail, packet or phone at the addresses/numbers given above

If there is sufficient interest shown, we set up a national organisation to lobby for less bureaucracy and simplified regulations to be applied to voice repeaters in Australia.

A Name

A name provides an important part of any organisation. Perhaps the "National Voice Repeater Association" or "Repeater Association National" (RAN). The name needs to be easy to say along with a catchy abbreviation and reflect the organisation. I look forward to your input.

If you happen to think that what we have at the moment is as it should be, then please by all means let me know. There is no point in spending time on an idea if it has little support.

29MHz FM

With the Sun spot activity predicted to peak in January 2000, 29MHz is alive and kicking. Unfortunately most of the kick is from the wall to wall pirate activity on the entire band. When the pirate activity gets up to the level we have now, the fight is almost lost, but at least we are the legal users of this exclusive Amateur band.

Log intruders and send in your intruder logs. For the next few years during daylight hours the 29MHz FM band allows Australia wide contact every day. Yes that is right, every day. Monitoring of the Melbourne 29MHz repeater in Perth has shown, as soon as the Sun comes up so does the repeater.

Experimentation has also shown that it is simple to link the Melbourne repeater onto one of our local 2 metre repeaters in Perth. This then allows easy hand held or mobile to mobile contact across the continent. It is a pity that voice repeater regulations prohibit this innovative use of amateur technology.

A simple change of one word in the voice repeater regulations would allow this type of activity. Legal activity on a band flooded with pirate activity. The change is in the sentence "no linking below 50MHz". Change the 50MHz to 29MHz, and fun could be had talking on FM across the country, from the ease and comfort of your mobile or hand held on 2 metres or 70 centimetres via 29MHz FM.

What is disappointing is that with changes like this taking several years if successful, we could miss this exciting propagation used in this innovative way, and have to wait until the next Sun spot high. Will we have a 29MHz band that is of any use at all to us by then?

There is a submission to lobby for just that simple change and it hopefully will be part of the next WIA/ACA liaison meeting to be held in July. I will keep you informed.

Amateur Radio
— another membership service from your WIA.

ARDF

Ron Graham VK4BRG
PO Box 323
Sarina Qld 4737

IN THE LAST COLUMN we covered some aspects regarding the use of simple receivers for ARDF. In retrospect, the description of handy talkies and portable scanners (which were the main devices discussed) as "simple receivers" is somewhat misleading. Commonly owned or available may have been a better description!

Mention was also made of some simple ARDF techniques. These will now be discussed in greater detail.

Body Shielding

This technique takes advantage of the human body attenuating the received signal, and we are talking about VHF and UHF frequencies. The largest mass of the human body is, in general, the abdominal area. So the receiver/antenna combination is held tightly against the abdomen and one turns through 360 degrees and looks for the minimal signal, which, with the bulk of the human body attenuating the signal, is from one's rear.

Interestingly enough, while typing this, another "blow by blow" description of the technique came to hand. I quote: "place handy talkie vertically in left hand with front panel towards abdomen, hold tightly against abdomen, rotate yourself for minimum signal, look rearward over left shoulder, this is the direction to the transmitter". Further explanation revealed that "looking rearward over left shoulder" means the direction is 45 degrees from one's rear towards the left.

Obviously various techniques (and no doubt, variables) exist and one would be advised to conduct some tests prior to any serious events. Possibly one's abdominal mass and its geometry affect results. An investigation of these matters could make an interesting subject for some prospective PhD candidate!

Attenuators

Reference has already been made to the limiting action when using FM receivers. Unless the receiver is fitted with an S-meter it is somewhere between difficult and impossible to tell any change in signal strength when this limiting action is taking place. The answer here is to use some sort of attenuator between the antenna and receiver. The amount of attenuation needed is adjusted to keep the signal noisy and then it is possible to judge the signal strength by ear.

The attenuator can take various forms. These may be used, either singly or in combination:

i) a supply of various BNC to BNC attenuators that are fitted between the receiver and antenna. The antenna may be removed completely with very strong signals.

ii) detuning the signal.

iii) use of a device similar to the ARDF converter.

iv) use the metal tube type attenuator (waveguide beyond cutoff).

Waveguide Beyond Cutoff

This latter device falls in the simple category and consists of a metal tube of sufficient diameter to allow the receiver and antenna to be inserted therein. The theory of operation is that this tube, at the frequencies involved, acts as a "waveguide beyond cutoff". Thus, a variable attenuator is formed with the amount of attenuation depending on how far the receiver/antenna combination is inserted into the metal tube. In practical use, the tube is held vertically and the receiver/antenna combination lowered into it by the carry strap or the carry strap extended with a piece of cord.

The above technique, together with body shielding offers the simplest and lowest cost way into direction finding, provided one already owns a suitable handy talkie or scanner. Also, keep in mind, as the frequency of operation is only limited by what is the receiver is capable of tuning, the technique may be used outside the amateur band. Examples could be an annoying pager, locked-on transmitters, interference problems etc.

The disadvantage against more sophisticated equipment, as I see it, is there are more variables involved and the results may be somewhat inconclusive. However, with practice, I believe some people have become quite proficient using these simple techniques. One could also say, that under some circumstances (like not having any other equipment available or having had other equipment fail) these techniques could mean the difference between continuing on and hopefully finding the transmitting device.

Conclusion

The above covers, what I consider, to be simple direction finding techniques. They are something with which I have had only limited experience. A lot of the information had been obtained from general reading on the subject plus input from others. Any further contributions to this column on this subject could be included at a latter date. I think it is important to keep investigating these simple, low cost techniques so that various people may easily and economically try ARDF, or indeed, any form of hidden transmitting hunting.

Further reference has been made to the "ARDF converter", often called an attenuator or ultimate attenuator. Hopefully, we can discuss this device further in the next column.

Korea

This Region 3 ARDF event takes place in mid June. (I write this column in May for the July issue). Travelling to Korea to participate are Bruce Paterson VK3TJN, Jack Bramham VK3WWW, Jason Morris VK4YOL, Bryan Ackerly VK3YNG and Adam Scammell VK3HDF. We wish that all went well for them and look forward to reading a report on the event in AR magazine.

SNIPPITS

Going Ohm

Ohm's law was derived when George Simon Ohm started to test various bits of materials for their opposition to current flow.

He discovered that by subjecting the materials to various known voltages and plotting the voltage against the measured current, the resulting graph was a straight line that passed through zero.

As any person trained in mathematics would know, he recognised this as a direct linear relationship.

We know this to be Ohm's Law. "In any fixed resistance, the current flow is proportional to the applied voltage."

POUNDING BRASS

Steve P Smith
7 Mitala Road
Newport NSW 2106
02 4334 7743

AS PROMISED a number of book reviews will appear in coming issues. This issue I will introduce you to a number of selected CW related poems I have accumulated over the years. Some of you should be very familiar with these others not so. The first poem I believe to be an "Australian Classic", "Coming Round The Bend" which is probably better known as "CRTB" written by Frank Spruhan, known by his contemporaries affectionately as "SPRU". Spru was one of those Telegraph legends one hears about while "Pounding Brass". In the 1960's a collection of his works was published, Spru put many of his thoughts about the Telegraph service into verse, "CRTB" is one such poem.

Spru who became a silent key in 1965 rested in the Jiliby cemetery in an unmarked grave up until November 1988, when the Sydney based Morsecodian Fraternity decided "Spru" deserved something better, they arranged to place an inscribed headstone on his grave, something Spru would have been very proud of.

Coming Round the Bend

I well remember Charlie Teede,
who used to work the races;
No need, indeed, to ask for speed,
He'd pace it with the pacers.
Lord help the man who broke him once
or questioned his "creations";
On him a flood of scorn was turned,
the atmosphere with brimstone burned,
and pitman green with envy squirmed,
at his abbreviations.
"Te field got wl awa to ti & as ty settld dwn
Te Shicer 1st t bk te li ws flwd bi Jo Brown.

In close proxim ws Tired Tim, Tn cme Arbtatn,
Bhnd te bunch ws Cntr Lunch, Gd luck and Hi Taxatn.
Ty whizzed along (and so did Charles)
Tthout te least cessatn.

Crtb te topwt jumped & got on trms wi Shicr,
Wo tn & tre hs bundl dumped Wh labld him a twicer,"
I scrambled after Charlie like a trailer round a bend,
Then gave OK-but queried "CRTB" u send.
Now what is that in aid of? Enlarge a bit my friend."

The sounder nearly hit the roof
as Charlie scorched the line.
"U ort t b on te rabtproof Or up at Doodlekine.
Chasin poddies rnd t yd Shd b ur chf pastime.
T tnk u cndt wrk tt out It nrly mks me sik.
Ani ole gin or rousabt Cd write it wi a stik.

Fanci a man wo calls hmself A tgst askg tt!
A record O S vacuum is located neath ur hat.
D'u want it in oils bi Lambert? Or carved on a marbl Stone?
Ole "Winja" Mortill cd tke it & ud nvr hr a moan;
Not spelt out li Ive dun fr u By cut dwn t te bone.

"Wl I mst sa its te bst dspla of ignrce Ive hrd,
O all te sqrts in W A Ur crtnli te "bird"
& ani Hrsh remks Ive mist Ty all cn b inferd
"CRTB"-its Known bi rote, Wt wd u ha me snd?
Its cmg rnd Te bnd-u goat.
Coming round the bend!

By Frank Spruhan

The following poems from the 1900's era:

That Station

Of all the stations I have worked,
This station is the best.
A 'Haunt' for all the lazy boys
And those who need a rest.

Hard at work at six o'clock,
Off come coats and vests,
You carry in a pile of wood
To smoke away the pests.

These pests are mainly different bugs,
(The skeeters are the worst)
And on the war-path all the time
For naught but blood they thirst.

With head phones on at even bells
You shoot some N-I-Ls.
The spiders get so thick just then
You pray for shrapnel shells.

At eight o'clock the 'Larm is set,
To wake you up for lunch;
You dim the glim and pull the shades
And roll up in a bunch.

At one o'clock you Q-R-U
And set the clock for four;
To get that M-S-G report,
The P&O waits for.

At four o'clock your work is done,
Youv'e got that M-S-G;
So nap till six then doctor up
That log artistically.

By D. Phectiff Inslater
Wireless Age, Nov 1915.
Also Appeared M.M.36 October 1994 (Issue)

Ode to Wireless Operator

When the air is fine and balmy and the ether's free and clear
and the sigs come in like thunder with a biff that jars the ears.
Then the PBO* is happy and he wears a sunny smile
and doesn't curse the traffic that keeps coming all the while.
But when the X's come on steady with a sizzly frizzly roar
and the sigs die down to nothing then the common Op gets sore
and the language that he uses melts the contacts off his key,
burns the "Bradfield" to a cinder leaves the aerial hanging free,
and the Old Recording Angel wears a stern and saddened look
as he logs the bad Op's language in the big Recording Book.

***(PBO=Poor Bloody Operator)**
By Harry Pearson
Sable Island 1905
Also appeared M M 24 1992 issue

Infatuation

O mystic fascination
O fate idealised
I'm but a mass of molecules
Reversely polarised.

I' am vanquished by sorcery
No amulet can cure
For love you are the magnet
And I the armature.

The more I circle round you
Love's current stronger grows
Till leaping forth from heart to heart
Love's arc electronic glows.

Against the ardor of that flame
Insurance won't insure
For, Love, you are the magnet
And I the armature.

The messages un-numbered
Of fond endearment fly
At once, in all directions
The wireless they outvie.

A throbbing heart is at the key
Its dots and dashes sure
For, Love, you are the magnet
And I the armature.

I dwell within your field of force
In that blest region where
Your strength is to the distance
Inversely as the square.

No influence external
Can me from you allure
For, Love, you are the magnet
And I the armature.

At last we'll cling together
Apart no more to roam
With hearts attuned harmonic
We'll sing of Ohm, sweet Ohm.

One circuit never broken
While life and love endure
Forever you the magnet
And I the armature.

By Park Benjamin
Wireless Age, 1915
Also appeared M M 33 April 1994 issue.

And finally a short one from the "Air Signallers" of World War Two:

The Air Signallers' Prayers

'In days of old
when W/Ops were bold
and sidebands not invented
the word would pass by sounding brass
and all were well contented
AMEN'

According to John Hall G3KVA
Appeared in Radcom, August 1994

I hope you enjoyed the poems as much as I did.
See you all next issue

Steve VK2SPS

I wish to thank those who recognised the circuit used in the May AR column. The photocopy that I worked from was unfortunately without any indication of the source. It was however identified as the Modified Cubic-Incher designed originally by Dennis Monticelli AE6C and later modified by Greg Bonaguide WA1VUG. It appeared in several editions of the ARRL Handbook, page 30-41 of the 1990 Handbook for example, where Q1 is suggested to be an MRF472.

As many of you could sympathise with, I have quite a collection of loose sheets and cannot always, or easily, identify the source.

Try This

Easy "Experimental Circuit" Board Manufacture

Graeme L Wilson
26 Dollis Way
Kingsley WA 6026

AFTER USING all of the common commercial and home-brew types of circuit boards over the years, I decided to make my own using a simple home-brewed tool and copper plated boards.

My tool was made from an old 5 BA tube or box spanner 10mm in diameter with a wall thickness of approximately 1mm and 120mm long. You could also use a similar length of 6 to 10mm steel tubing.

Cut off the hexagon end section, back to where it was still circular, and file 8 teeth on the end with a small triangular file. One way is to cut diagonally across the tube with a junior hack saw or modellers saw then divide the remaining sectors in half and then all sectors in half again.

File each tooth into a saw tooth shape. Remember to note which direction the drill turns. To harden the teeth, heat them to a cherry-red and plunge them into clean, cold water. For mild steel you can heat it to a yellow colour (straw) and dip just the cutting end into ordinary sugar until it cools. Then heat it again to a cherry red and chill in water as before. That will carbonise the surface of the mild steel and make it harder.

Lay out a grid of pencilled lines approximately 12mm apart on the copper clad board. Mount the tool in a bench drill and set the stops to a depth just enough to cut through the copper layer. Use a drill vice or clamp a piece of wood to the drill table as a guide and adjust it to line up with the first grid line. Now make sure that the PCB is flat against the table and hard up against the guide, and line up the first hole.

Hold the PCB firmly and drill the first ring. If the board "wants" to move, stop and check that the teeth are level with each other. One longer than the rest will cause the board to want to oscillate like an orbital sander.

So far a 200mm x 100mm board has lasted over a year, 5 projects and half the board still remains for future circuits. The continuous ground-plane makes component placement easy and you build your project then cut it off to size without waste.

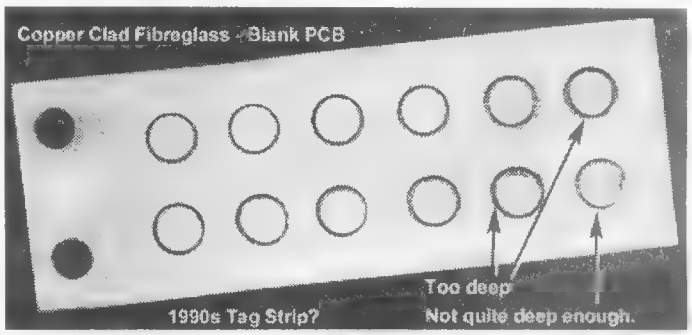


Photo 1 A sample piece of PCB cut with an 8mm ms tube. (The two holes were already in the PCB.)

AWARDS

John Kelleher VK3DP
Federal Awards Officer
4 Brook Crescent, Box Hill South, Vic 3128 (03) 9889 8393

Recently, I received information which I feel should be passed on to the Amateur fraternity. It concerns DX prefixes for certain Pacific countries.

KC6 - Belau.

This prefix is no longer available for amateur radio use since Belau became a politically independent state in its own right. It is no longer a part of Micronesia. The prefix for this country is now T88 and T88 only.

V6 - Micronesia The correct name for this country is The Federated States of Micronesia, and includes Yap, Chuuk, Kosrae, and Pohnpei. As with the situation for Belau, above, the prefix KC6 is no longer used.

T2 - Tuvalu T2 is now not available for amateur use. It is currently in use commercially for shipping, aircraft etc. Amateur prefixes in Tuvalu run T20 through T29. The use of any other form of prefix is definitely illegal. A similar situation exists in Kiribati, where T3 is for commercial use, and T30, T31, T32 and T33 for amateur use.

C2 - Nauru The prefix C2 is now used for commercial purposes only. The prefix C21 is the only one set aside for amateur use.

This important information comes from Jack D Haden, who although not a member of WIA is always ready to help and assist his fellow amateurs. He also advises that he will be QRV from T30 and C21 for about two weeks early in July. Thank you Jack, VK2GJH.

In a special bulletin, the DXCC Desk has announced that a purge of 9U contacts will take place as far back as January 1st 1994, and after. The DXCC Desk reasoning is : " The submission of forged documentation is a clear violation of DXCC Section 1 Basic rule 7, and also rule 12(a). The list includes the following call signs, and may or may not be limited to these. 9U/F5FHI, 9U/EA1FH, 9U5W, 9U5DX, 9U5T, and 9U5CW. The station 4U9U is OK."

Although QSL cards for the E44 operation are arriving in the mail, sadly I cannot add this new entity until about the 1st of October 99. So please be patient.

JT - Mongolia

It is expected that GM4DMA will be active during this month. QSL via home call.

Dxpeditions are also expected from T31 (Canton Is) 23/9/99 to 3/10/99 and from ZK3 from 7/10/99 until 12/10/99.

E41/E44/4X. Hide, JM1LJS plans to be active from these three areas during the period of 23/7/99 to 1/8/99. Activity will depend entirely on his work schedule.

V6 - Micronesia

Sam, V63KU will be active until year's end. Qsl via JA6NL.

3W6 - Vietnam

Karl, W9XK will be active until 20/7/99 signing 3W6XK. Qsl via home call.

Look for amateurs in Alberta, Canada using the prefix CY6 until July 14th to promote the Calgary Stampede.

Alaska -

The Alaska DX CertificateContacts with 10 Alaskan amateurs as follows : One each from Southeastern (that part of KL7 east of 141 W longitude) Northern (above the Arctic Circle) Aleutian Islands (including Kodiak Island and the Alaskan peninsula south of 58 degrees North latitude , and Central Alaska (including Anchorage and Fairbanks). The remainder may be from any part of KL7.

However, of these 10, 4 must be members of the Anchorage ARC. Any modes or bands (except WARC bands). Contacts since 1-1-55. No fee, but return postage for certificate is required. GCR list certified by three (3) licensed amateurs or official at National level to :-

Anchorage ARC KL7AA
Box 101987
Anchorage
Alaska 95510

Canada -

Canadian QRP AwardContact all 12 Provinces and Territories of Canada on 2-way QRP. (Defined as using not more than 5 watts CW, or 10 watts PEP SSB). GCR list and fee of 2 IRCs to :-

Jeff Heatherington VA3JFF
3399 Cardinal Drive
Niagara Falls Ont
Canada L2H 3A6.

Denmark - Copenhagen Award

Contact stations in the Copenhagen area. Scandinavian stations need 15, Europeans need 10, all others need 5. Available CW, Phone, or mixed, all bands. SWL OK. GCR list and fee of 5 IRCs or US$3.00 to :-

Allis Anderson OZ1ACB
Kagsaavej 34
DK-2730 Herlev
Denmark

Malaysia - The All Malaysia Award.

Work 10 9M2, one 9M6 and one 9M8 after 31 Aug 1957. Endorsements available for any combination of band or mode. SWL OK. GCR list and fee of US$5.00 to :-

MARTS Award Manager
Eshee Razak 9M2FK
PO Box 13
10700 Penang
Malaysia.

Malta - Malta Amateur Radio League Series.

General requirements : Awards are available for amateurs and SWL's. GCR list and fee of 15 IRCs or US$4.00 for DX applicants. Apply to:-

The President MARL PO Box 575 Valetta Malta

(1) The Diploma Mediterranean Award

Work a minimum of 15 of the 26 listed Mediterranian countries, 9H being mandatory. The countries are : Albania, Algeria, Balearic Islands, Ceuta-Melilla, Corsica, Crete, Cyprus, Dodecanese Is, Egypt, France, Gibraltar, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Morocco, Sardinia, Sicily, Spain, Syria, Tunisia, Turkey and Yugoslavia.

(2) The 9H Diploma

Contact stations in Malta. Europeans must earn 10 points, all others 5. Each 9H qso counts as one point except Club station 9H1MRL, and any 9H4, both of which count for 2 points.

Oman - The A4X Award

Contact A4X stations , 8 on SSB or 5 on CW. GCR and 5 IRC's to :-

Award Manager ROARS
P.O. Box 981
Muscat
The Sultanate of Oman.

Good luck and good hunting, de John, VK3DP

ar

CONTESTS

Ian Godsil VK3DID
57 Nepean Highway, Aspendale 3195

Contest Calendar July - September 1999

Jul 1	Canada Day Contest	(CW/Phone)	(Jun 99)
Jul 3	Jack Files Contest	(CW)	(May 99)
Jul 3	Australasian Sprint	(CW)	(Jun 99)
Jul 3	NZART Memorial Contest	(CW/Phone)	(Jun 99)
Jul 10	Australasian Sprint	(SSB)	(Jun 99)
Jul 10	Jack Files Contest	(SSB)	(May 99)
Jul 10/11	IARU HF World Championship	(CW/SSB)	(Jun 99)
Jul 10/11	Internet 6 Metres DX Contest	(CW/SSB)	
Jul 17	Pacific 160 Metres Contest	(May 99)	
Jul 17/18	SEANET CW Contest	(Jun 99)	
Jul 18	Colombian Independence Contest	(CW/SSB/RTTY)	(Jun 99)
Jul 23	ACORNZ 'Zip' Contest	(Phone)	(Jun 99)
Jul 24	Waitakere Sprint	(Phone)	(Jun 99)
Jul 24/25	Russian RTTY WW Contest		
Jul 24/25	RSGB IOTA Contest	(CW/SSB)	(Jun 99)
Jul 30	ACORNZ 'Zip' Contest	(CW)	(Jun 99)
Jul 31	SARS Sprint Contest	(SSB)	(Jun 99)
Jul 31	Waitakere Sprint	(CW)	(Jun 99)
Aug 1	YO DX Contest	(CW/SSB)	
Aug 7	SARS Sprint Contest	(CW)	(Jun 99)
Aug 7/8	Worked All Europe DX Contest	(CW)	(Jul 99)
Aug 14/15	Keymen's Club of Japan Contest	(CW)	
Aug 14/15	RD Contest	(CW/SSB)	(Jul 99)
Aug 21/22	SEANET SSB Contest		(Jun 99)
Aug 28/29	SCC RTTY Championship		
Aug 28/29	TOEC WW Grid Contest	(CW)	
Sep 4/5	All Asia DX Contest	(Phone)	(May 99)
Sep 4/5	Bulgarian DX Contest	(CW)	
Sep 11/12	Worked All Europe	(Phone)	(Jul 99)
Sep 18/19	SAC DX CW		
Sep 25	Internet CW Sprint Contest		
Sep 25/26	SAC DX Phone		
Sep 25/26	CQ WW RTTY DX Contest		

Thanks this month go to the ARRL.

Worked All Europe DX Contest

7/8 August (CW), 11/12 September (SSB), 6/7 November (RTTY); 0000z Sat - 2400z Sun. The object is to work European stations (except in the RTTY section where anyone works anyone). Bands are 80 - 10 m. In the contest, avoid 3550-3800 and 14060 - 14350 kz on CW and 3650 - 3700, 14100 - 14125 and 14300 - 14350 kHz on SSB. The minimum time of operation on a band is 15 minutes, although bands may be changed within this period if, and only if, the station worked is a new multiplier. Categories are single operator all bands; multi-operator single transmitter; and SWL all bands. DX cluster support is allowed. A maximum of 36 hours is allowed for single operator stations, with up to three rest periods (mark them in the log).

Exchange RS(T) plus serial number. Additional points can be gained reporting QTCs as follows: after working a number of European stations, details of those QSOs (ie QTCs) can be reported during a current QSO with a European station. In the CW and phone sections, QTCs are sent from non-European stations to European station. In the RTTY section, QTCs can be sent to any station, including non-Europeans, outside one's own WAC continent. A QTC contains the time, callsign and QSO number of the station being reported, eg: "1307/DA1AA/431" means you worked DA1AA at 1307z and received serial number 431. Commence QTC traffic by sending the QTC series and number of QSOs to be reported, eg "QTC 3/7" indicates that this is the third series and that seven QSOs will be reported. A QSO may be reported only once and not back to the originating station, who can be worked more than once to complete the quota. Only the original QSO, however, will have points value.

Multiplier on each band equals the number of European countries worked on that band (or on RTTY only, the number of DXCC/WAE countries), times a band factor. The band factors are four for 80 m, three for 40 m and two for 20/15/10 m. Add the band multipliers together and multiply by the sum of (QSOs + QTCs) to obtain the final score.

SWLs may log each station heard, European and non-European, once per band. Logs must contain both callsigns and at least one of the control numbers. Score one point for each station logged and one point for each complete QTC received (max 10 per station). It is possible to claim up to two multipliers per logged QSO.

Use standard log summary sheet format. Include a check list for more than 100 QSOs on any band and, if more than 100 QTCs have been sent, include another check list to show that the quota of 10 QTCs per station is not exceeded. Logs can be submitted in ASCII on DOS disc, providing a paper summary is included. Send logs to: WAEDC Contest Committee, Box 1126, D-74370 Sersheim, Germany. Deadlines are 14 Sept (CW), 14 Oct (SSB) and 14 Dec (RTTY).

European countries are: C3 CT1 CU DL EA EA6 EI EM/N/O ER ES EU/V/W/ F G GD GI GJ GM GM(Shetland) GU GW HA HB HB0 HV I IS IT JW(Bear) JW(Spitzbergen) JX LA LX LY LZ OE OH OH0 OJ0 OK/L OM ON OY OZ PA R1/FJL R1/MVI R/U(RUSSIA) RA2 S5 SM SP SV SV5(Rhodes) SV9(Crete) SV(Mt Athos) T7 T9 TA1 TF TK UR-UZ(Ukraine) YL YO YU Z3 ZA ZB2 1A0 3A 4U(Geneva) 4U(Vienna) 9A 9H.

Keyman's Club of Japan

14/15 August, 1200z Sat - 1200z Sun

This contest is designed for CW enthusiasts and will particularly suit those who are collecting Japanese prefectures for awards. The only category is single operator multi-band. Suggested frequencies are: 1908-1912 (split), 3510-3525, 7010-7030, 14050-14090, 21050-21090 and 28050-28090 kHz. Exchange RST plus continent code (OC). JAs will send RST plus district code.

Score one point per QSO. Multiplier on each band is the total number of JA districts (max 62 per band). Final score equals total points X total multiplier. Show duplicate QSOs with zero points. Attach a summary sheetshowing all usual information and send log to: Yasuo Taneda JA1DD, 279-233 Mori, Sambu Town, Sambu, Chiba 289-12, Japan, postmarked no later than 15 September 1999. ASCII logs on DOS disc most welcome.

ar

SPOTLIGHT on SWLing

by Robin L. Harwood VK7RH
5 Helen Street, Newstead Tasmania 7250
(03) 6344 2324
E-mail: robroy@tassie.net.au

So far it has been a very mild winter here in northern Tasmania and although we have had some rain, it has not been as cold as we have come to expect. The nearby mountains are without their usual snow covering, causing the ski operators on Ben Lomond to shake their heads.

Usually I hear stations coming from Europe, across Antarctica around 0200 UTC, corresponding to midday locally, on the lower frequencies, particularly on the 49 and 41 metre broadcasting allocations. Strangely enough this year I am not observing any until 0300 with signals coming from another direction. 7 MHz does perform better yet the noticeable auroral flutter is absent. Paul Ormandy in Oamaru NZ is however hearing signals at 2400 UTC, which corresponds with his local midday. At that time signals here are still coming in on the short path from Europe.

Propagation on the higher frequencies in the daylight hours is also very interesting. The WARC band of 17 metres has become extremely lively with Europeans virtually on around the clock. I cannot determine if the propagation is long path or short path, yet I suspect both, as some signals have multipath echoes. Another indication that the Europeans are there is the absence of Asian signals. Usually there are two strong Japanese meteorological stations sending fax weather pictures on 18220 and 18440 kHz and when they are absent, the Europeans come in very well. I also note that when they come up, so do the American stations on 17 metres.

The other WARC allocation between 24890 and 24990, commonly referred to as 12 metres, has not been as active. There seem only to be a few VK's talking to Stateside. 27 MHz and surrounding frequencies do have CBers yet it does not seem as congested as the previous sunspot high. I am aware that there are numerous low power FM and AM signals from up north, across the entire 10 metre amateur allocation. Most of them seem to be in either Thailand or the Philippines.

The 21 MHz broadcasting allocation has probably the best propagation. The United Arab Emirates in Abu Dhabi is excellent on both 21630 and 21735 kHz from 0200 in Arabic.

There is practically no fading and the signal level is constant. To confuse matters, there is another station also called United Arab Emirates Radio on 21700 in Arabic and English but is located in Dubai and is a separate station. I think Abu Dhabi relays domestic programming whilst Dubai is an external service. The Turkish radio from Ankara is broadcasting to Australia around 0200 in Turkish on 21715 and from 0400 UTC they are on with an excellent signal up until 1200 UTC. Signals seem to peak around 0600 UTC and quickly fade here once the Sun has set.

Radio Kuwait has been heard in English on 15105 kHz at 0500 also a relay of the domestic AM /FM networks. The program I heard was a documentary on how they put out all those oil well fires after the Iraqis were expelled. Kuwait is also on 11675 and 15495 kHz in Arabic from 0100 UTC.

On July 12, Globe Wireless will be closing down their remaining HF stations for Morse traffic. WCC, KFS, KPH and WNU have already stopped traffic lists and also their marker signals. They are concentrating now on e-mail and also intend to phase out SITOR. Globe Wireless uses an encrypted form of Clover for e-mail at 200 baud over their worldwide chain. They seem to be the only maritime or public traffic station using Clover, with the majority of the others sticking with SITOR. Amateurs used AMTOR, which is identical for some years but are now using PACTOR, G-TOR, or Clover.

Some are also experimenting with a form of Heller Schreiben, an early German FAX system used by the Nazis. Remember that signal from China that used to be around 14115? It used to sound like a frog. That was it originally sounded like but with computers it sounds much different. The Heller folks hang about on 14065 kHz.

The conflict in the Balkans drags on. NATO has been targeting both telecommunications. Infrastructure and broadcasting stations in Serbia and Kosovo. Radio Yugoslavia on 7200 kHz was broadcasting at 1100 UTC in Serbian and at 1108 it was silenced by an air raid which destroyed the facility. The senders located in Bosnia are untouched although the lines taking the audio through Serbia to the site were hit. Although Montenegro is a part of the Yugoslav Federation, the government has tried to be neutral and raids have concentrated instead on Yugoslav troops there. Montenegro also took in some refugees from Kosovo, which displeased the Yugoslav government. Also the media in the republic has taken an independent stance from Belgrade.

The VOA has been broadcasting live the daily NATO briefings from Brussels over "News Now" at 1300 UTC. This has been interesting yet when the generals go to a video clip or refer to a map on the screen; the announcers in Washington quickly fade away.

This also occurs when there is a question and reply in French.

Last month I referred to Merlin Network One broadcasting to Australia on 13720 kHz at 0600. No sooner was it written before programming from the independent commercial British station was reduced. Now it has been reported only on for one hour a day, Monday to Friday between 1700 and 1800 on the 49-metre allocation. It is on spasmodically between 0700 and 1600 on 9915 kHz. It no longer is beamed to Australia.

Bob Padula has been publishing the Australian Shortwave Guide for a few years now. It contains listing of the major short-wave stations heard in Australia. It is two parts. The first 16 pages contain the station listings in country and time order, the second 16 usually articles on a station or a theme. Edition 7 was released on the 17th of May and costs $10, obtainable from Padula Books, 404 Mont Albert Road, Surrey Hills VIC 3127. Phone/Fax (03) 9898 2906 or e-mail bpadula@compuserve.com.

Mr. Padula has also been compiling the Electronic DX Press (EDXP), an e-mail delivery of the latest news on short wave, but he has now put this in recess, and I am uncertain if it will re-appear. The EDXP has helped many keep abreast of happenings, but I appreciate that it has taken a lot of time, dedication and money, with little support.

Well, the consensus is that the Millenium and the 20th Century will finish on December 31st 1999 at 2359 UTC. As somebody said on 40 the other day, it will "suddenly" be realised that 2000 is still the 20th century and we will go through it all over again. But I don't think so although the concept of the Millenium has been a commercial bonanza.

Until next time, the very best of 73 and good listening. **ar**

Monitoring Station of Yesteryear

John Wright L21068
4/33 Kerrie Crescent
Peakhurst NSW 2210

I NOTED WITH interest Bill Rice's comment on page 2 of AR May, about Hamads. I have been building up quite a collection of valve communication receivers, otherwise known to most as "Boat Anchors", with help from the Hamads.

I am WIA member L21068 — yes, just a listener member. I became interested in 1970. and have been a listener ever since. The pirate CB craze put an end to my amateur ambitions. With a simple one watt Midland set connected to a beam antenna, my being able to hold a conversation with someone in the USA really started and finished in one big hit in 1970. After that I have chased the shortwave bands for entertainment.

I have always been fascinated with the big communications valve sets, both military and commercial, especially on a cold night seeing the big purple glow from those valves! They give such a warm feeling. Some of the sets seem even to have a personality.

Then it hit me. ... The old valve sets could become a monitoring station

A few years back I visited Ian O'Toole's Castle Hill military museum, with his vast array of military communications gear. I was amazed how many were sets I had passed up over the years. People had often asked if I wanted an old valve set, but I had just politely said no.

Then it hit me. My main interest was monitoring the shortwave bands. The old valve sets could become a monitoring station. Well, why not? It also would preserve the past for others to enjoy, instead of ending up at the tip. So I decided to collect these old valve receivers and restore them to their former glory.

At this time I came to know Robbie Varga at Ermington, about 16 km away across Sydney. Rob had a few valve receivers, but we had no idea of what was to happen. We became firm friends, and with Rob's enthusiasm, we have collected over 80 valve communications receivers!

Rob is blessed with a huge double garage, so earlier this year we decided to set up the monitoring station in the backyard of his home. So, after some four years, here is the thrust of the Hamads "Give me a hernia", and "will bring a broom".

Imagine, a double garage complete with racks running the length of the walls filled with AR7s, Hallicrafters, Hammarlund, RACAL, Collins, etc. Well, that is what we have. We are up to the stage of restoring some of those magnificent Admiralty B40s. What beasts! At 55kg each these are good for weightlifters! The powerpoints are in. Yes, we have three phase power! The next job, after repairs, is to put up all manner of antennas. Probably a dipole for each metre band. The idea is to have BC221 frequency metres for readout ± 1kc/s, each receiver being allocated to a certain frequency, and suitable aerial. This not only preserves the past, but gets the old sets going again, hopefully for a future generation. As it is, I am 42 years of age, but there are precious few people younger than me with an interest in these fields. Hopefully this will being in a few to appreciate the goodies this radio hobby has to offer. We also have a huge array of technical manuals, but you can never have too many.

I would like to thank the many amateurs who have called and given their old equipment and or parts and magazines and books. Without these, I doubt that we would have the setup we have now. Rob and I envisage that in November this year all the racks and sets will be complete, and the monitoring station of yesteryear will be there in all its glory. A few photographs have been taken, and will feature shortly, in another article, before the station is finished.

We "L numbers", too, can take an active role in the hobby of radio and more importantly, support the WIA.

If anyone wishes to help out with any gear, etc. the Hamads section is where you'll find me! Thanks again!

ar

SNIPPITS

Genesis of a generator

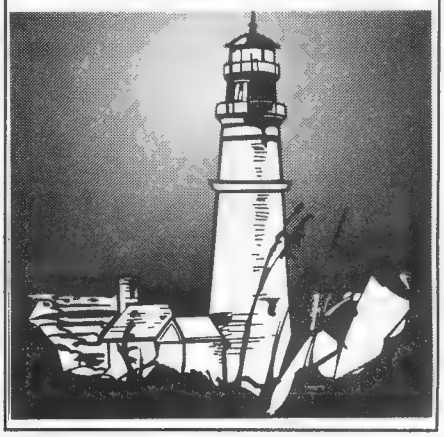
Although Michael Faraday showed in 1831 that a disk rotated between the poles of a horseshoe magnet would produce electricity; it was not until 1870 that a Frenchman, Zenobie Gramme, developed the first commercially viable generator.

It consisted of a coil of iron wire made into a doughnut (toroid) over which a coil of copper wire was wound as you would wind a balun. The copper coil was tapped every few turns and those taps were terminated on a commutator.

The whole assembly was placed over an iron shaft, separated and positioned by wooden blocks. The resulting armature was spun between iron poles that were wrapped in copper coils.

The coils and armature windings were all connected in series -I believe. As the speed increased the voltage also increased.

The Gramme generator was the first commercially viable generator. It was used to drive the arc-lamps of coastal lighthouses.



HF PREDICTIONS

by Evan Jarman VK3ANI
34 Alandale Court, Blackburn Vic 3130

July 1999
T index: 125

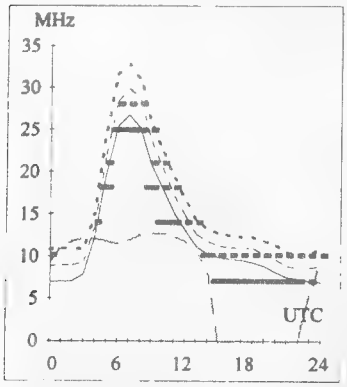
These graphs show the predicted diurnal variation of key frequencies for the nominated circuits. These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Useable Frequency
- E-layer Maximum Useable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

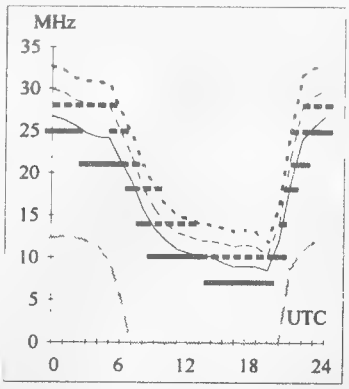
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies; when useable. The path, propagation mode and Australian terminal bearing are also given for each circuit.

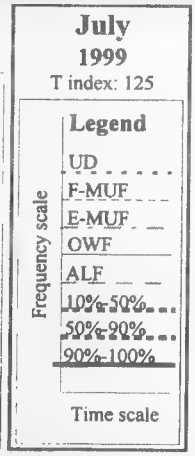
These predictions were made with the Ionospheric Prediction Service program: ASAPS version 4.

Adelaide-Johannesburg 237
Second 4F5-6 4E0 Short 10042 km

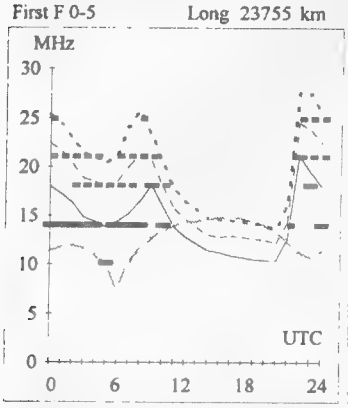


Brisbane-Christchurch 141
First 1F5-7 1E0 Short 2517 km

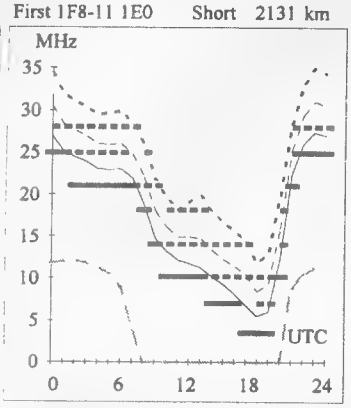




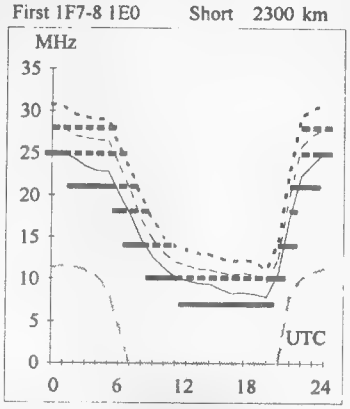
Adelaide-London 132
First F 0-5 Long 23755 km



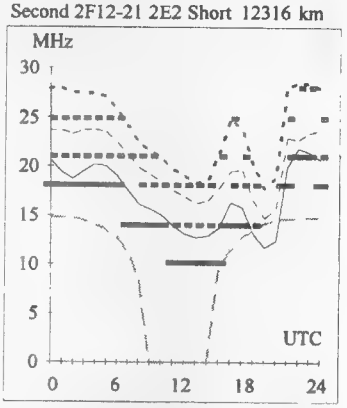
Brisbane-Honiara 21
First 1F8-11 1E0 Short 2131 km



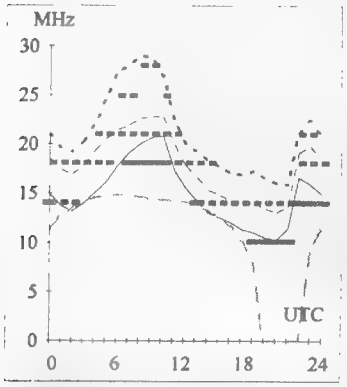
Canberra-Auckland 102
First 1F7-8 1E0 Short 2300 km



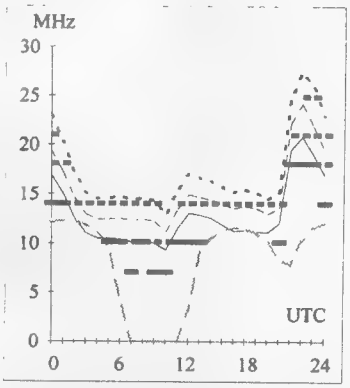
Darwin-San Francisco 54
Second 2F12-21 2E2 Short 12316 km



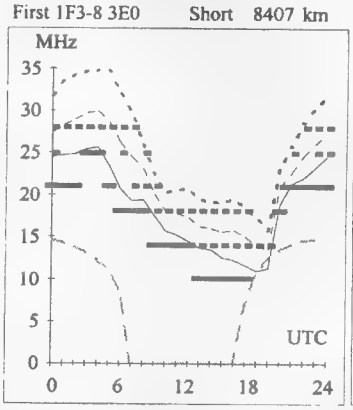
Adelaide-London 312
First F 0-5 Short 16269 km



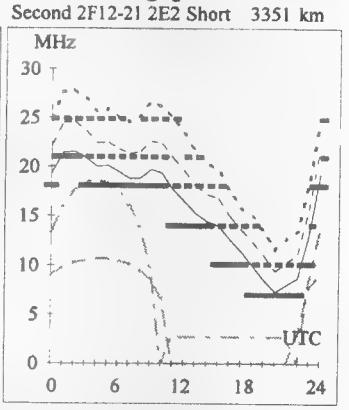
Brisbane-Montevideo 154
First F 0-5 Short 12431 km



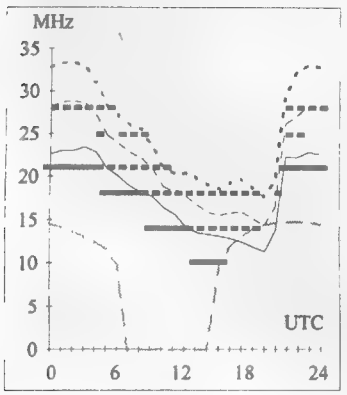
Canberra-Honolulu 50
First 1F3-8 3E0 Short 8407 km



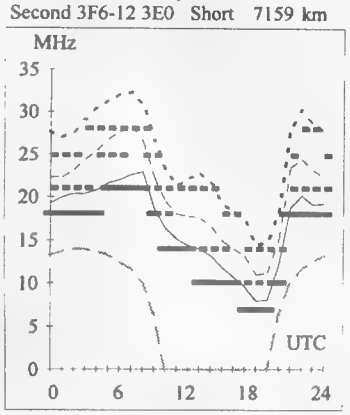
Darwin-Singapore 295
Second 2F12-21 2E2 Short 3351 km



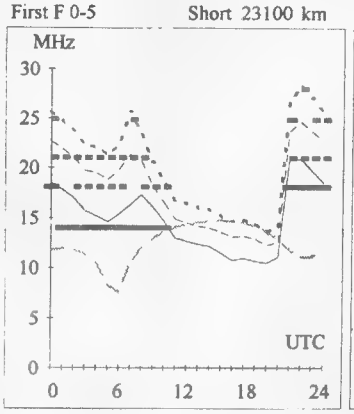
Adelaide-Los Angeles 66
First F 0-5 Short 13158 km



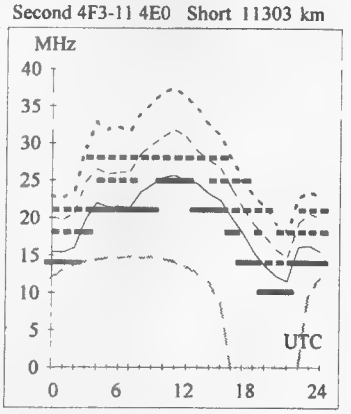
Brisbane-Tokyo 348
Second 3F6-12 3E0 Short 7159 km



Canberra-Paris 130
First F 0-5 Short 23100 km

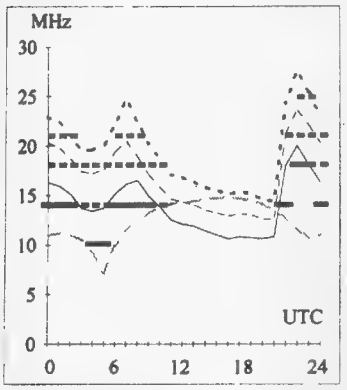


Darwin-Tel Aviv 301
Second 4F3-11 4E0 Short 11303 km

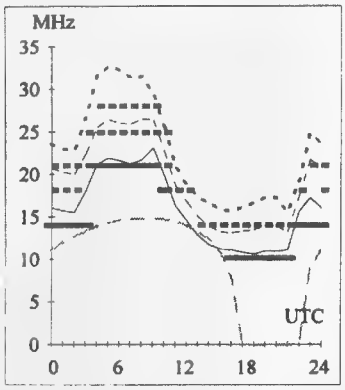


HF PREDICTIONS

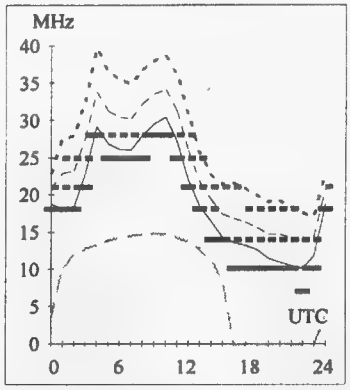
Hobart-Berlin 124
First F 0-5 Short 23552 km



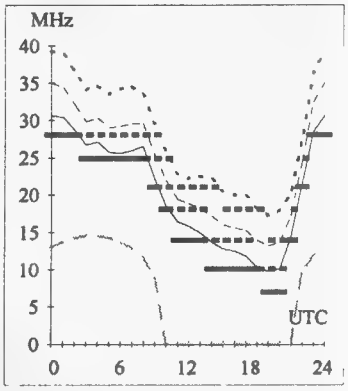
Melbourne-Athens 289
First F 0-5 Short 14950 km



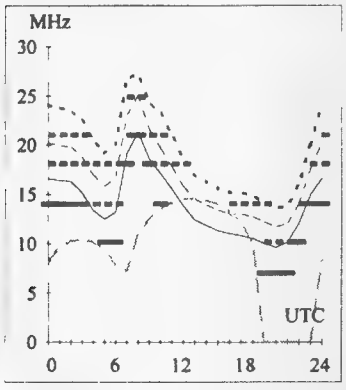
Perth-Cairo 298
Second 4F3-9 4E0 Short 11263 km



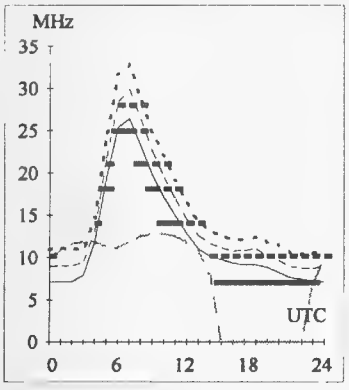
Sydney-Manila 324
First 2F2-6 2E0 Short 6263 km



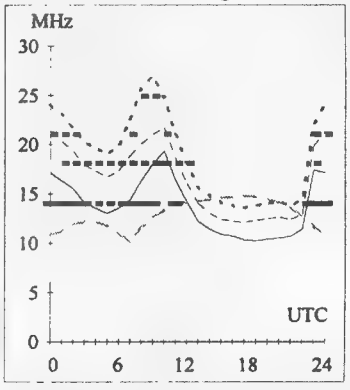
Hobart-Dakar 209
First F 0-5 Short 16556 km



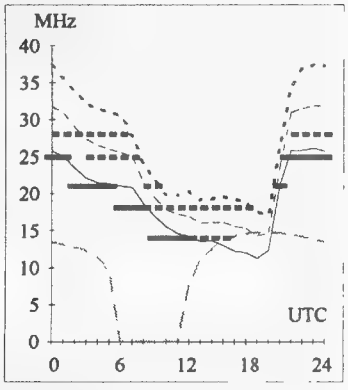
Melbourne-Pretoria 234
Second 4F5-6 4E0 Short 10352 km



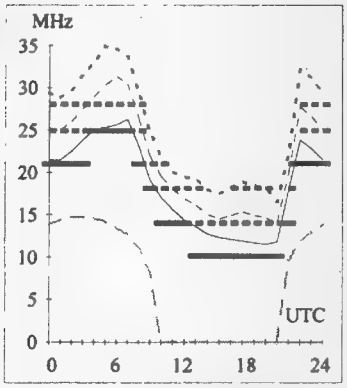
Perth-London 133
First F 0-5 Long 25543 km



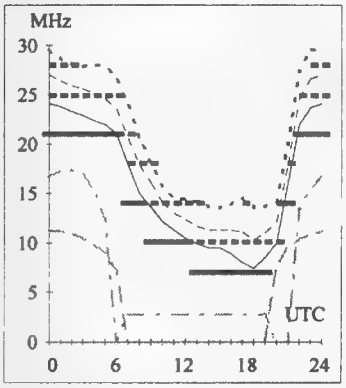
Sydney-Miami 86
First F 0-5 Short 15027 km



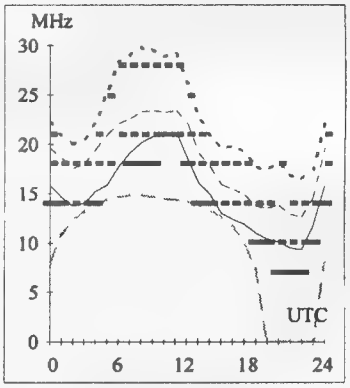
Hobart-Osaka 350
First 3F3-7 3E0 Short 8704 km



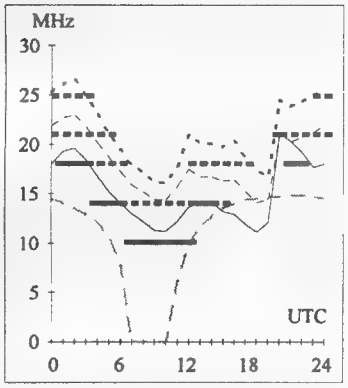
Melbourne-Suva 65
Second 2F9-11 2E0 Short 3913 km



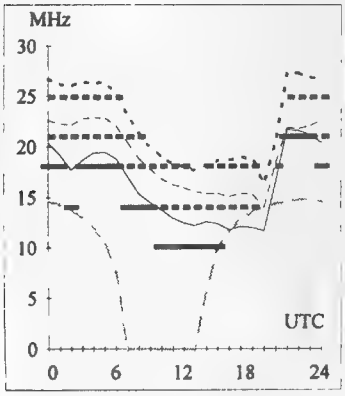
Perth-London 313
First F 0-5 Short 14481 km



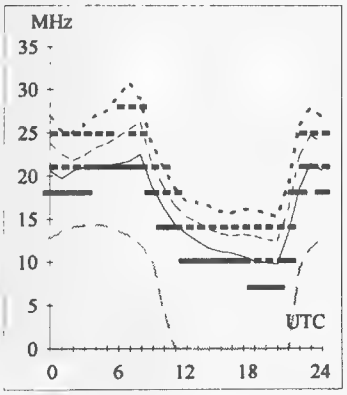
Sydney-Ottawa 58
First F 0-5 Short 15864 km



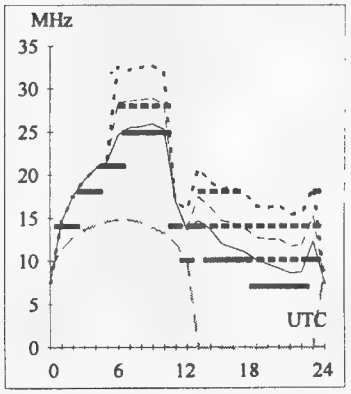
Hobart-Vancouver 49
First F 0-5 Short 13428 km



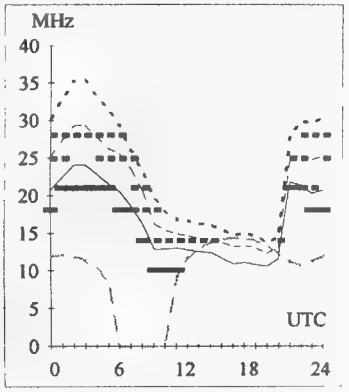
Melbourne-Taipei 337
Second 3F5-11 3E0 Short 7408 km



Perth-New Delhi 325
Second 3F5-12 3E0 Short 7872 km



Sydney-Surinam 133
First F 0-5 Short 15907 km



HAMADS

- Hamads may be submitted on the form on the reverse of your current Amateur Radio address flysheet. Please print carefully, especially where case or numerals are critical.
- Please submit separate forms for For Sale and Wanted items, and be sure to include your name, address and telephone number (including STD code) if you do not use the flysheet.
- Eight lines (forty words) per issue free to all WIA members, ninth and tenth lines for name and address. Commercial rates apply for non-members.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), with a minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy should be typed or in block letters, and be received by the deadlines shown on page 1 of each issue of Amateur Radio, at:

Postal: *Newsletters Unlimited, 29 Tanner Street, Richmond, 3121*
Fax: *03 9428 4242* *E-mail: newsl@webtime.com.au*

Please only send your Hamad once
Please send Hamads by mail OR fax OR email (much preferred).
Please do not send by more than one method for any one ad or issue, it is confusing.

FOR SALE ACT

• **BIRD** 4385 RF Power Analyst for CW, PEP, SWR, Return Loss uses Mod 43 Plug-ins digital display in W or dB. New $460. **ICOM** all-mode transceivers 471H 75W 70cm and 271A 25W 2m with Mutek front-end ea $800 Ed VK1VP QTHR 02 6249 6348

• **YAESU** FC-700 HF Antenna Tuner $200 Ed VK1NBH 02 6251 2312 or email gudruned@telstra.easymail.com.au

• **YAESU** FT-101 s/n 11211367 xcvr, Manuals, $300 ONO Rick VK1ALR, QTHR or BH (02) 6201 7890 0r AH (02) 6258 9228

• **YAESU** FT 757 GX2 P/s FP707 ATU FC757 mobile bracket, OUTBACK 7 band 2mts $1800 ICOM IC 281H, 1/2 wave ant $300 6m IC502 $75. VHF HH TH 27A access $250. MFJ Ant HIQLOOP $300 or all above plus shack clearance $100s for $2500 Greg VK1GPC Home Tel /Fax (02) 6247 3771

FOR SALE NSW

• **TRANSFORMER** 600 x 600 CT 300mA 2 Filter CHOKES 4H 300mA $20 Lot. 2- 866 Rectifiers $10 pair. New KT66 $10 each. 1-829B new $10. 1-829B and ceramic socket $10. AWA VTM $20 Strobe Flash (DAWE) $20 Audio and Signal Generators Cheap $16-20 VK2AHP 02 9746 6858

• **YAESU** 726R tribander with uhf, vhf, 50m,and satellite modules fitted. Ex.cond. All manuals. $900. **GSL Electronics** DC/DC converter 24/12volts. 20 amp output. Model SM-120 switchmode. New never used. $150. VK2COF David. Phone 02 4861 5734.

• **YAESU** FL2100B linear $600.00 Yaesu FL2100Z linear $850.00 Yaesu FT980 HF tcvr. $850.00 Yaesu FRG7700 comms rcvr. $250.00 **Kenwood** TH215 2mt. port. $300.00 **Kenwood** TR7625 2mt. xcvr. $150.00 President HR2510 10mt. xcvr. $200.00 Glen VK2FC Ph.02 49826800

• **LOW NOISE** Ham Location. Elevation 1100m in the BlueMountains 3km from Bell, Just 1.5 hours drive from Ryde. Ideal weekender or retirement. Well built one bedroom house (furnished) on 3.5 acres $95,000 Bob (02) 9878 2359

• **YAESU** FT901D gc. $450. **YAESU** FT101ZD gc. $450. **YAESU** F.V.901 ext-vfo Memory unit gc. $200. **YAESU** FT301D gc. $500. **YAESU** FP 301D p/s gc. $300. **YAESU** YO 301 Monitor scope gc.$280. **YAESU** FV 301 ext-vfo gc.$200. **YAESU** FL2100B Linear Amplifier gc. $800. **YAESU** FT209 2m. TX-RX handheld PA3 charger car adapter MH 12 Speaker Mic never used $300. **PALOMAR** 12v 200W H.F. linear $150. Hi-Mound Keyer never used $75. Home brew **ATU** $100 kw. dummy load gc $75. Peter VK2DBI QTHR 02 6367 5095

• **KENWOOD** TS430S (FM-ETC) $550 ono. **TOKYO** HIGH POWER HC 250 ATU $100 ono. **TOKYO** HIGH POWER HC500 ATU $100 ono. **DAIWA** CL66 1kw ATU $100 ono.**DAIWA** CNW 217 100W **ATU** $80 ono. **Dick Smith** Co-ax switches 1kw $20 ea ono. **MFJ** 1040B Preselector $140 ono. **Timewave** DSP 9 $130 ono. 1 x Speech Processor (G3FEW) Amateur or CB $15 ono. Ian VK2AMM 02 4932 8935

• **ICOM** IC736 HF/6M 100W 101MEM. $1400 **MFJ** 969 Versa tuner $250. **Tandy** PRO2005 Scanner 25-520M 760-1300m 400 Mem $300. **Alinco** DJ-X1 Miniature Scanner 100K-1200M 100 Mem $250. **Bearcat** BC590XLT Scanner 29-512M 100mem $250. **Bearcat** UBC9000XLT 25-1300M 500Mem $300. **YAESU** FT26 2 Metre Miniature H/Held $250. **REALISTIC** HTX-100 10 metre T/Ceiver $200. **KENWOOD** TR7800 2M T/ceiver $200. **PRESIDENT** HR25 10 Metre T/ceiver $200 S/Ns available Tony VK2BOA 02 4943 8981 Fax 02 4920 6893 aob@hunterlink.net.au

• **YAESU** FT411 HT 2M XCVR 5W with Spkr/Mic car adap. charger case and book. s/n 1T 461376 P.C. $200. **KENWOOD** TM241 50W 2M Mobile XCVR with book P.C $300. **ICOM** ICQ 7 Dual band XCVR RX Cover 30-1300 MHz as new s/n/01160 $250 John VK2CCC 02 4984 9770.

• **ICOM** IC-P2CT 2m 5 Watt output, 99 memories HH transceiver with 12V nicad pack and dry cell case. As new, complete with instruction book and soft case. 2 available. $160.00 each or $300.00 the pair. VK2HL, QTHR, Ph 99719795.

• **YAESU** FT-757GX HF tcvr SN 3L020097 EC $550. YAESU FC-700 Antenna Tuner SN 3D020822 EC $100. **MD1** Desk Mic $40. Bencher YA-1 Low-pass Filter $60. **YAESU** FL-2100B linear amp SN 7N240468 GC $450. **YAESU** FT-690R 6m tcvr SN 1L020993 GC $240. **Tokyo** Hy-power HL-66V 6m linear amp SN 500751 GC $140. **KENWOOD** TR-751A 2m tcvr SN 7070102 EC $450. **KENWOOD** TR-851A tcvr SN 8080111 EC $550. **AEA** PK232 Multi-Mode TNC (No mailbox) **SN 19073** EC $200. Bencher BY-2 Iambic chrome paddle $60. **Emtron** EP-2000 SWR/Power meter SN 318 EC $80. **Labtech** Q 0155 20Mhz scope, RF probes SN 6056185 EC $450. **MFJ**-209 HF/VHF SWR analyzer EC $150. **MFJ**-440 UHF SWR analyzer EC $110. **YAESU** FT-4700RH V/UHF mobile tcvr w/MX-2 diplexer SN 410436 EC $500. **YAESU** YH-1 headset & SB-10 PTT switch new $40. **ATN** 13-30 log-periodic antenna $450. **SATTRACKER** 2/70 antenna, crossed yagi $300. **KENPRO** KR-400 Az rotator $180. **KENPRO** KR-500A El rotator $250. **NALLY** 13.7m tilt/telescope tower w/comps $600. **Emtron** EDM-1 Dip Meter EC $50. **Field** Strength meter DSE kit H/brew $20. **Emtronics** EM5 whip antenna $80. **Capacitance** meter H/brew $45. **WISHER** digital Freq. counter 1.2 GHz $100. **DSE** AR220 antenna rotator 250 Kg $100.**Revex** L20 15w/100w dummy load $25. **Engine** immobiliser kit Jaycar $10. **Wireless** intercom 2 station $35. Most items in original packing. Transmitting gear to licensed Amateurs only. Bill VK2APN 02 4421 4947.

• **ALINCO** DJ100T with extras $180. ALINCO DR-M40HX 70cm mobile 35 W $ 280. KENWOOD TS50 hf mobile $ 950. KENPRO KR400C rotator $ 200. Andrew VK2AR (02) 9896 5859

• **CAVITY** FILTERS 2M. Sufficient heavy gauge 100mm copper tube and brass for end caps to make six cavities. What offer? Goulburn Amateur Radio Society David VK2BDT 02 4821 5036.

FOR SALE VIC

• **For sale** from the estate of the late Norm Eadie VK3UP: **1 - YAESU** 101Z transceiver with YD 148 dual impedence mic,manual and cables $300 O.N.O. **2 - YAESU** FL2100B linear with spare 572B tube.$600 O.N.O. Ring Arthur VK3VQ (03) 9598-4262 anytime

• **SHACK** CLEARANCE:**1 - GOODWILL** 5 MHz single beam CRO with spare mains transformer. $65 **2 - MFJ** 114 Giant LED 12/24 hour clock.Brand new.Never used.$55 **3 - GRUNDIG** grid dip oscillator 1.7 to 250 MHz. EC. $125 **4 - LEADER** LMV10 audio millivoltmeter. 1.0 MHz bandwidth. $60. **5 -**

LEADER LAG120A audio sine/square wave generator to 1.0 MHZ. $40. **6 - WINRADIO** 1000i all mode computer based communications receiver. 150KHz to 1300 MHz The original Australian designed computer radio. Minimum needs a 486 with 4 Mb RAM and sound card. Only 5 months old. Can be seen going by arrangement. Cost $499.95. Will sell for $400. O.N.O. Harold VK3AFQ (QTHR) (03) 9596 2414 anytime.

• **KENWOOD** TS-660, Covers 6m, 10m, 15m, 12m, 11m, all modes, good condition, $400. Richard VK3ZCL (03) 9729 1947

• **KENWOOD** TS930S HF Transceiver in mint condition with service manual. $800.00. Ken VK3FKD QTHR Phone 03 9798 6530.

• **VIDEO** (???) IF Sweep Generator Model VP-886A 20-30Mc Sound IF Sweep generator Model VP 884A 5.5Mc. Trap Adjustor model VP 882A 5.5Mc Telequipment Oscilloscope D51 182717 reasonable offers Tony VK3PTV 03 9729 1513.

• **RENOVATORS** OR COLLECTORS delight. Weston LM160 base station and mobile say $50. Max VK3VI 03 5147 1763.

FOR SALE QLD

• **AEA** DSP 232 Never used. This modem allows transmit & receive on all digital modes. DSP can also receive TDM, Navtex, black & white weather fax. Ideal for Digital Short Wave listeners as well. All manuals, cables for two separate radios, connect package,"loop Back' with connector & jumper, RS -232 cable. Cost $1200.00 Sell $500. ONO. Email:beejay@power.com.au.VK4YWY (07) 3205 8488, 7 Curran Close Bray Park Qld 4500

• **KENWOOD** TS440S AT HF Transceiver Excellent condition as new MB430 Mobile Bracket $950. **TOKYO** HY-POWER HC500 ATU HF $125. **LEADER** LSG-16 Signal Generator $100. **KENWOOD** PS-32 Power Supply $225. **SHURE** 526-T Amplified Dynamic Base Microphone $150. **HUSTLER** 4BTV HF Trapped Vertical $175 John VK4SKY 04 1741 0503 Box 1166 Coolangatta 4225 QLD.

• **RADIOTRON** Designers Handbook $50. **TRANSWORLD** solid state linear 500W $1500. **SWAN** 350 DC/AC PSU/S $350. **HALLICRAFTERS** SX 101A $330. SX-111 $200. STC 4017 Mic $50 NATIONAL NCX3 DC/PSU spares. OFFER . **TERMAN** Radio Engineers Handbook 1st 1943 Flyer. Peter VK4APD 07 3397 3751 AH.

• **KENWOOD** TS570S As new full warranty sn 90400156 $1650 **KENWOOD** PS32 Power supply as new $200 boxed. **KENWOOD** TM241A 50Watt output 2Metre FM 118-174Mhz receiver $275. **KENWOOD** TS 140S MC-43S DC Lead as new in box $850. **HUSTLER** 4BTV $150 any inspection welcome. John Abbott VK4SKY 04 1741 0503 PO Box 1166 Coolangatta QLD 4225.

• **KENWOOD** TS430S Mobile bracket, scanning hand mike, owner and service manual $580 ono **KENWOOD** TS440S with automatic antenna tuner and narrow CW-Filter Mobile Bracket Scanning hand mike, owners and service manual $780 ono. **LONG WIRE** antenna Model A248D 3.5 to 14MHz takes up to 1KW $80. Mr F S Nicolls. 11 St Andrews Ave Birkdale QLD.

• **DSP** Modem 2232 Timewave sn 14037 never used manuals $450 VK4YWY 07 3205 8488.

FOR SALE SA

• **KENWOOD** TS-130S AT-130 ATU VFO-120 MC-50 Desk Mic, mobile Bracket service and all other manuals, excellent condition $830. **8EL** log periodic Antenna $400. Sell complete for $1100 more for sale Paul VK5MAP QTHR Ph/Fax 08 8651 2398.

FOR SALE WA

• **EIMAC** 4-1000 pull, exc condition, plus ceramic socket, SK506 glass chimney, and HR8 top cap $300Doug VK6ER (08) 9361-5594 (10am-6pm). email to vk6er@telstra.easymail.com.au

• **ICOM** IC451A $280. **ICOM** IC 251A $220. **ICOM** IC551D $380. **JRC** JST135 c/w headset/ mic $1880. **HENRY LIN**.AMP 2KD 80-10 $2150. **HENRY** LIN.AMP 2006A 6m 1KW $2300. **HENRY** LIN.AMP 2002A 2m 1KW $2300. **HEATHKIT** LIN>AMP SB1000 160-10 $920. **HR2510** 28MHz XCVR $120. **AR88D** vintage RX $440. **COLLINS** R390A mint $880. All excellent condition, manuals. All ono VK6ACY QTHR 08 9571 4161 fax 08 9571 4340.

FOR SALE TAS

• **YAESU** Service manual suit FT900 all models new $40. **YAESU** CT20 Mic. cable adaptor suits **YAESU** MDIC8 Base Mic to 8pin modular style plug FT900 and other **YAESU** Mobiles $20 Allen VK7AN 03 6327 1171 Mob 0417 354410.

• **KANTRONICS** KPC3 VHF packet modem with box and manuals mint condition $180 Phil VK7PU 03 6431 9284.

WANTED NSW

• **TUNE-UP** AND CIRCUIT INFO needed for FM-806 Philips Transceivers for rescue squad. Maurie VK2DCD 014 438 215 Box 72 Coleambally 2707.

WANTED VIC

• **DISC DRIVE** with controller and printer interface to suit VZ-300 Vic VK3KVT QTHR 03 9754 4860.

• **KENWOOD** DG5 Good working order digital display complete with cables etc to suit TS520S. George VK3VAM QTHR 03 9557 6056

• **AERIAL** TUNING UNIT for surplus military radio type WD c13 Tony VK3PTV 03 9729 1513

WANTED QLD

• **EIMAC**. SVETLANA. RF Parts 3-5002 glass transmit tubes. Heavy duty Antenna rotator. Heavy duty HF linear Amplifier. HENRY. TEN TEC. COMMANDO. ALPHA. Antenna Telex HYGAIN TH7DXX. 204BAS TELREX CUSHCRAFT A4S Tower DEEKO butt section or Hills crank up. John Abbott VK4SKY 0417 410 503 PO Box 1166 Coolangatta 4225 Queensland.

• **BUTTERNUT** HF4B assembly instructions wanted all expenses paid for a copy and postage. Mr F S Nicholls 11 St Andrews Ave Birkdale 4159.

• **ICOM**-781 Transceiver in good condition with manuals Jim VK4JS QTHR 07 3206 4193.

• **VALVES** two only 6A3 or two only 6B4 or dare I ask two or 4 only 2A3. Malcolm, VK4ZMM QTHR 07 32985454

WANTED SA

• **MICRONTA** 22-202B Multimeter operators Instructions will pay costs, photocopy will be OK Paul VK5MAP QTHR Phone fax 08 8651 2398.

• **TEKTRONIX** Sampling unit type ISI plus, if possible the probe to suit. VK5ZST C S Ratcliff 08 8520 2988.

• **HANSEN** VSWR Meter vertical wall mounting approx 5"x 2"x 2" HWD SO239 each end top and bottom. VK5ZLC QTHR 08 8294 6906.

WANTED TAS

• **VALVES** QEO8-200 +QV08 -100 small quantity required 535-A (as used in Boonton Qmeter model 260-A) T67/ ARC-3 or -49 VHF Transmitter any condition. Trevor VK7TB 03 6398 2118.

MISCELLANEOUS

• **SWAP** MORSE KEYS for other keys or telegraphic items: CLIPSAL PMG Key bakelite Base laquered Brass: WW2 Bomber bathtub key: Bendix MT-118 WW2 Aircraft key: WW2 Australian services small key PMG made: Similar WW2 Australian Key on steel base model B50410. All good restored condition. Ric VK2PH QTHR 02 9817 0337.

• **Amateur** and CB magazines free 1960-1995 Ring to arrange pick-up. 03 9557 6056.

• The Federal WIA QSL Collection requires QSLs. All types welcome especially rareDX pictorial cards, special issue. Please contact the Hon. Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose VIC 3765 (03) 9728 5350

• If you got your licence before1974 you are invited to join the **Radio Amateurs Old Timers Club.** A $2.50 joining fee plus $5.00 per year gets you two interesting Journals plus good fellowship

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:**

For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama).

www.cyberelectric.net.au/~rjandusimports

Agencies at: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra.

• **WEATHER FAX programs** for IBM XT/ ATs *** "RADFAXZ" $35.00, is a high resolution short-wave weather fax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M. Delahunty, 42 Villers St, New Farm QLD 4005. Ph 07 358 2785.

WIA Division Directory

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers		News Broadcasts Note: All times are local. All frequencies MHz.	Fees
VK1 ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Hugh Blemings John Woolner Les Davey	VK1YYZ VK1ET VK1LD	3.590, 146.950, 438.375, 438.325, 438.225 & 438.025 FM each Sunday from 8.00pm AEST. News text on packet BCAST@VK1BBS, *http://www.vk1.wia.ampr.org & aus.radio.amateur.misc newsgroup.* Send items by packet as personal message BCAST@VK1BBS or e-mail to broadcast@vk1.wia.ampr.org.	(F) $72.00 (G) (S) $58.00 (X) $44.00
VK2 NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124) Phone 02 9689 2417 Freecall 1800 817 644 Fax 02 9633 1525	President Secretary Treasurer (Office hours Mon-Fri 11.00-14.00) Web: *http://ozemail.com.au/~vk2wi/* e-mail: *vk2wi@ozemail.com.au* Packet BBS: VK2WI on 144.850 MHz	Michael Corbin Eric Fossey Eric Van De Weyer	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 14.170, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1273.500 (* morning only) with relays to some of 18.120, 21.170, 581.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) $69.00 (G) (S) $56.00 (X) $41.00
VK3 Victorian Division 40G Victory Boulevard Ashburton VIC 3147 Phone 03 9885 9261 Fax 03 9885 9298	President Secretary Treasurer (Office hours Tue & Thur 0830-1530) e-mail: *vk3wi@rint.com.au* Web: *http://www.tbsa.com.au/~wiavic/*	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st Sunday of the month, starts 10.30 am. Primary frequencies, 3.615 LSB, 7.085 LSB, and FM(R)s VK3RML 146.700, VK3RMM 147.250, VK3RWG 147.225, and 70 cm FM(R)s VK3ROU 438.225, and VK3RMU 438.075. Major news under call VK3WI on Victorian packet BBS and WIA VIC Web Site.	(F) $75.00 (G) (S) $61.00 (X) $47.00
VK4 Queensland Division GPO Box 638 Brisbane QLD 4001 Phone 07 3221 9377	President Secretary Treasurer e-mail: *secretary@wiaq.powerup.com.au* Web: *http://www.wiaq.powerup.com.au*	Colin Gladstone Peter Harding Alistair Elrick	VK4ACG VK4JPH VK4FTL	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 21.175 MHz, 28.400 MHz SSB, 29.220 MHz FM, 53.725 MHz FM, 147.000 MHz FM, 438.500 MHz (Brisbane only), and regional VHF/UHF repeaters at 0900 hrs EAST Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) $74.00 (G) (S) $60.00 (X) $46.00
VK5 South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone 08 8352 3428 Fax 08 8264 0463	President Secretary Treasurer Web: *http://www.vk5wia.ampr.org/*	Ian Hunt Merv Millar Joe Burford	VK5QX VK5MX VK5UJ	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. 3.585 MHz and 146.675 MHz FM Adelaide, 1930 hrs Monday.	(F) $75.00 (G) (S) $61.00 (X) $47.00
VK6 West Australian Division PO Box 10 West Perth WA 6872 Phone 08 9351 8873	President Secretary Treasurer Web: *http://www.faroc.com.au/~vk6wia/* e-mail: *vk6wia@faroc.com.au*	Cliff Bastin Christine Bastin Bruce Hedland-Thomas	VK6LZ VK6ZLZ VK6OO	146.700 FM(R), 438.525 FM(R), 29.120 FM at 0930 and 1900 hrs Sundays from Perth, relayed (morning only) on 1.865, 3.564, 3.582 (Busselton), 7.075, 14.116 (North), 14.175 (East), 21.185, 50.150; (morning and evening) 146.900(R) Mt William (Bunbury), 147.00(R) Katanning, 147.200(R) Cataby, 147.250(R) Mt Saddleback (Boddington), and 147.350(R) Busselton; (evening only) 1.865, 3.564 MHz.	(F) $62.00 (G) (S) $50.00 (X) $34.00
VK7 Tasmanian Division 24 Targett Street Scamander TAS 7250 Phone 03 6372 5305	President Secretary Treasurer Web: *http://www.wia.tasnet.net* e-mail: *vk7kpg@hamnet.hotnet.com.au*	Ron Churcher Paul Godden John Klop	VK7RN VK7KPG VK7KCC	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart), repeated Tues 3.590 at 1930 hrs.	(F) $74.00 (G) (S) $60.00 (X) $46.00
VK8 Northern Territory (part of the VK5 Division and relays broadcasts from VK5 as shown, received on 14 or 28 MHz).				**Membership Grades** **Full (F) Pension (G) Needy (G) Student (S) Non receipt of AR (X)** **Three-year membership available to (F) (G) (X) grades at fee x 3 times.**	

ADVERTISERS INDEX

Amateur Transceiver Radio ... 16
Andrews 5
Av-Com 16
Brisbane Car Sound .....IFC
Dick Smith ..... IBC 28,29
Electronic Tube and Valve..... 5
Icom..... OBC, 43
Radio & Communication..... 41
Rocom Components..... 17

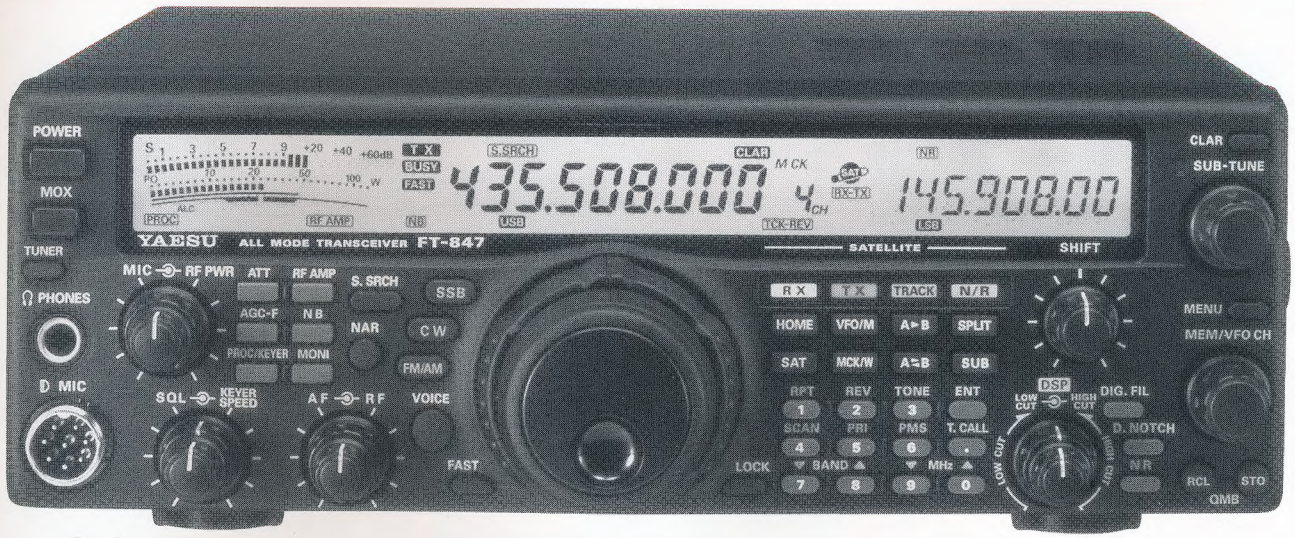
TRADE PRACTICES ACT

It is impossible for us to ensure that the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore, advertisers and advertising agents will appreciate the absolute need for themselves to ensure that the provisions of the Act are strictly complied with.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

FT-847 EARTH STATION



Only one transceiver gives you all-mode operation on the HF, 6m, 2m, and 70cm bands with full satellite capability...

the new Yaesu FT-847 "Earth Station"

Ready for action on SSB, CW, AM, FM and Digital modes, the FT-847's compact size makes it ideal for a variety of portable/mobile applications as well as for serious base station operation. You get a solid 100W output on the HF and 6m bands, 50W output on both 2m and 70cm, dual fan cooling and a rugged diecast chassis. Plus, the ultra-quiet HEMT receive pre-amp on 2m and 70cm contributes to the FT-847's industry best sensitivity figures. Advanced Digital Signal Processing (DSP) circuitry enhances received signal/noise ratio for easier copy of signals under marginal conditions through the use of 16 selectable noise reduction algorithms, while the Bandpass and Auto-notch filters aid the IF based Shift and Noise Blanker circuits in reducing interference on crowded bands.

The FT-847 is ready for satellite operation, with crossband full duplex operation, normal and inverted VFO tracking of the satellite uplink/downlink, as well as 12 special satellite memories with alpha-numeric tags. Also provided is a low-noise Direct Digital Synthesiser (DDS) that provides tuning steps as small as 0.1Hz, plus there's an adjustable DSP bandpass filter as narrow as 25Hz for exceptional weak-signal CW performance. You can also install optional Collins® mechanical filters in both the transmit and receive chain for enhanced SSB operation, as well as a 500Hz Collins® filter in the receiver side for CW. An RF-style speech processor with adjustable frequency shift voice tailoring is also provided to add punch to your SSB transmissions.

The FT-847 is ready for data modes, with a rear panel Data In/Out socket and a Packet socket for 1200/9600 baud VHF/UHF operation. Other features include extended receive operation (37-76, 108-174, and 420-512MHz), a high-speed computer control interface, 10 key keypad for band/frequency entry, and a Shuttle-Jog tuning ring for fast QSY. Also included are encode/decode CTCSS and DCS operation, selectable channelised steps for FM operation, FM narrow/wide modes for 29MHz use, and a large LCD screen with adjustable backlighting.

Each transceiver is supplied with a hand-mic, DC power lead and a comprehensive instruction manual. Call us for a copy of Yaesu's 6 page colour brochure to learn more about this incredible value "Earth Station" transceiver.

D 3425

2 YEAR WARRANTY

YAESU

$2995

DICK SMITH ELECTRONICS

That's where you go!

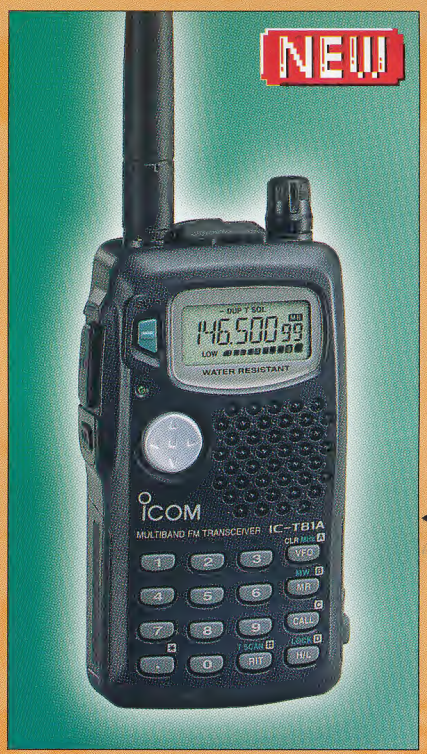
A 230-B 3973 FIBC

MORE GREAT GEAR FROM ICOM

PCR100 **Cruise the air waves with your computer.** Turns your PC into a high performance 0.5 - 1300 MHz receiver (FM/WFM/AM modes) with plug'n play installation. Multi function control panel, wide frequency coverage, and unlimited memory channels.

R2 **Fit the world's airwaves in your shirt pocket.** Just 8.6cm high, wide 0.5 - 1300 MHz frequency range divided into 9 bands plus FM/WFM/AM, 400 memory channels, great sound in rugged water resistant construction.

2800H **A totally new approach to dual band mobile.** Powerful performance on 2m and 70cm bands, remote control capability, and a first for mobile rigs...a multi-function colour LCD screen! All your information is right in front of you in colourful 3D-like characters and icons.



T81A **A remarkably compact quad bander.** Superb clarity on the 6m, 2m, 70cms and 23cm bands. It's water resistant, with tone squelch and pocket beep functions standard, plus you can change volume and bands even quicker with the 'joy-stick' style multi-function switch.

706MKIIG **The amazing evolution of the legendary 706.** Frequency coverage is expanded to the 70 cm band and output power is increased for the 2m band. You get base station performance and features in a mobile rig-sized package.

ICOM
Clearly Ahead

2 YR WARRANTY

See your nearest Icom Dealer,
call Icom on 1800 338 915,
or visit our website at www.icom.net.au

LL BROWN ADV 7342

Volume 67 Number 7 July 1999
Print Post Approved PP349181/00420